

A320-200

NORMAL PROCEDURES

Revision Date: 1OCT17
For simulation use only





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INTRODUCTION

This document is a guide to operate the A320 consistent with airline procedures used around the world.

This manual contains all procedures to go from a cold and dark flight deck at the departure aerodrome all the way to switching off all electrical power at the destination gate.

Note that certain steps and details not reproducible in P3D or as a single pilot have been omitted. This allows for a simplified and streamlined manual without interrupting the flow specified by the aircraft manufacturer.

For those users never having taken any flying lessons outside a simulator; For a safe and realistic operation of an A320 aircraft it is vitally important that all the procedures and numbers specified in this document are known by heart. All you use for reference is a small flight checklist during various stages of the flight.

This may sound hard to accomplish for some, but if you use this document from the beginning – to prevent learning and memorizing incorrect procedure flows- then you'll be able to fly "by the book" in no time.

It is recommended to have a good look at the introduction manual supplied with the FSLabs A320-X before you take it for a first flight using this document. This will ensure you have correct settings in Prepar3D to make full use of the software and its capabilities.



AIRCRAFT POWER UP

ENGINES

ENG MASTER 1 and 2 switch ----- OFF
MODE selector ----- NORM

LANDING GEAR

L/G lever ----- CHECK DOWN position

WIPERS

CAPT WIPER selector and F/O WIPER selector ----- OFF

ELECTRICAL SYSTEM

- If the aircraft has not been electrically supplied for 6 h or more, perform the following check:

BAT 1 pb and BAT 2 pb ----- CHECK OFF
BAT 1 and 2 VOLTAGE ----- CHECK ABOVE 25.5 V
Battery voltage above 25.5 V ensures a charge above 50 %.

▪ **If battery voltage is below 25.5 V:**

A charging cycle of about 20 min is required.

BAT 1 pb and BAT 2 pb ----- AUTO
EXT PWR pb ----- ON

Check on ELEC SD page, that the battery contactor is closed and the batteries are charging.

▪ **After 20 min:**

BAT 1 + 2 pb ----- OFF
BAT 1 and 2 VOLTAGE ----- CHECK ABOVE 25.5 V

▪ **If battery voltage is above 25.5 V:**

BAT 1 pb and BAT 2 pb ----- AUTO

If the APU is started on batteries only, it should be started within 30 min after the selection of batteries to AUTO (35 min after battery selection to AUTO, the battery charge is less than 25 % of maximum capacity).

- If the aircraft has been electrically supplied during the last 6 h:

BAT 1 pb and BAT 2 pb ----- AUTO

▪ **If the AVAIL light is on:**

EXT PWR pb ----- ON

HYDRAULICS

WARNING Do not pressurize hydraulic systems without clearance from ground crew.



APU FIRE TEST/START

APU FIRE

APU FIRE pb-sw ----- IN and GUARDED
AGENT lights ----- OUT

- **If the APU is already running, ensure that the following check has already been completed. If not, perform it.**

APU FIRE TEST pb ----- PRESS

Check:

- APU FIRE warning on ECAM + CRC + MASTER WARN light (if AC Power available).
- APU FIRE pb-sw lighted red.
- SQUIB light and DISCH light on

APU START

- **If EXT PWR pb ON light is on:**

APU MASTER SW pb-sw ----- ON

APU START pb-sw ----- ON

EXT PWR pb ----- AS RQRD

The flight crew should keep ON the external power units to reduce the APU load, particularly in hot weather conditions.

- **If EXT PWR pb ON light is out:**

APU MASTER SW pb-sw ----- ON

APU START pb-sw ----- ON

COCKPIT LIGHTS

COCKPIT LIGHTS

COCKPIT LIGHTS ----- AS RQRD

*DOME light should be on because it is the only lighting source in the EMER ELEC configuration.
The DIM position is recommended for takeoff.*



BEFORE WALK-AROUND

F/CTL

FLAPS ----- CHECK POSITION

Check the upper ECAM display to confirm that the FLAPS position agrees with the handle position.

SPEEDBRAKE lever ----- CHECK RETRACTED and DISARMED

WARNING If flight control surface positions do not agree with the control handle positions, check with the maintenance crew before applying hydraulic power.

PARKING BRAKE

PRK BRK handle ----- ON
BRAKE and ACCU PRESS indicator ----- CHECK

- Check for normal indications.

- The ACCU PRESS indication must be in the green band. If required use the electric pump on yellow hydraulic system to recharge the brake accumulator.

WARNING Yellow and green hydraulic systems are pressurized from yellow electric pump. Get ground crew clearance before using the electric pump.

PROBE/WINDOW HEAT

PROBE/WINDOW HEAT pb ----- CHECK AUTO

AIR COND

APU BLEED pb-sw ----- ON

Do not use APU BLEED, if ground personnel confirms that ground air unit is connected. Pilots should also check the BLEED SD page to determine whether an HP ground air unit is connected (pressure in the bleed system).

ALL WHITE LIGHTS ----- OFF

X BLEED selector ----- AUTO

Zone temperature selectors ----- AS RQRD

Full range temperature 24 +/- 6 °C.

CARGO HEAT

TEMPERATURE selector ----- AS RQRD

ELEC

Scan and check that there are no amber lights, except GEN FAULT lights.

VENT

Check all lights off.



ECAM

RCL key ----- PRESS 3 seconds

This action recalls all the warnings that the flight crew cleared or cancelled during the last flight.

➞ On the DOOR SD page:

OXY ----- CHECK PRESSURE

▪ If the OXY pressure is half boxed in amber:

MIN FLT CREW OXY CHART ----- CHECK PRESSURE

Verify that the pressure is sufficient for the scheduled flight: Min. 486 psi

➞ On the HYD SD page:

RESERVOIR FLUID LEVEL ----- CHECK WITH NORMAL RANGE

➞ On the ENG SD page:

ENG OIL QUANTITY ----- CHECK NORMAL

Check that the oil quantity is at or above 9.5 qt + estimated consumption (average estimated consumption ~ 0.5 qt/h).

REAR AND OVERHEAD CIRCUIT BREAKERS PANELS

REAR and OVERHEAD CIRCUIT BREAKERS panels ----- CHECK

Check that all circuit breakers are set. Reset as necessary.

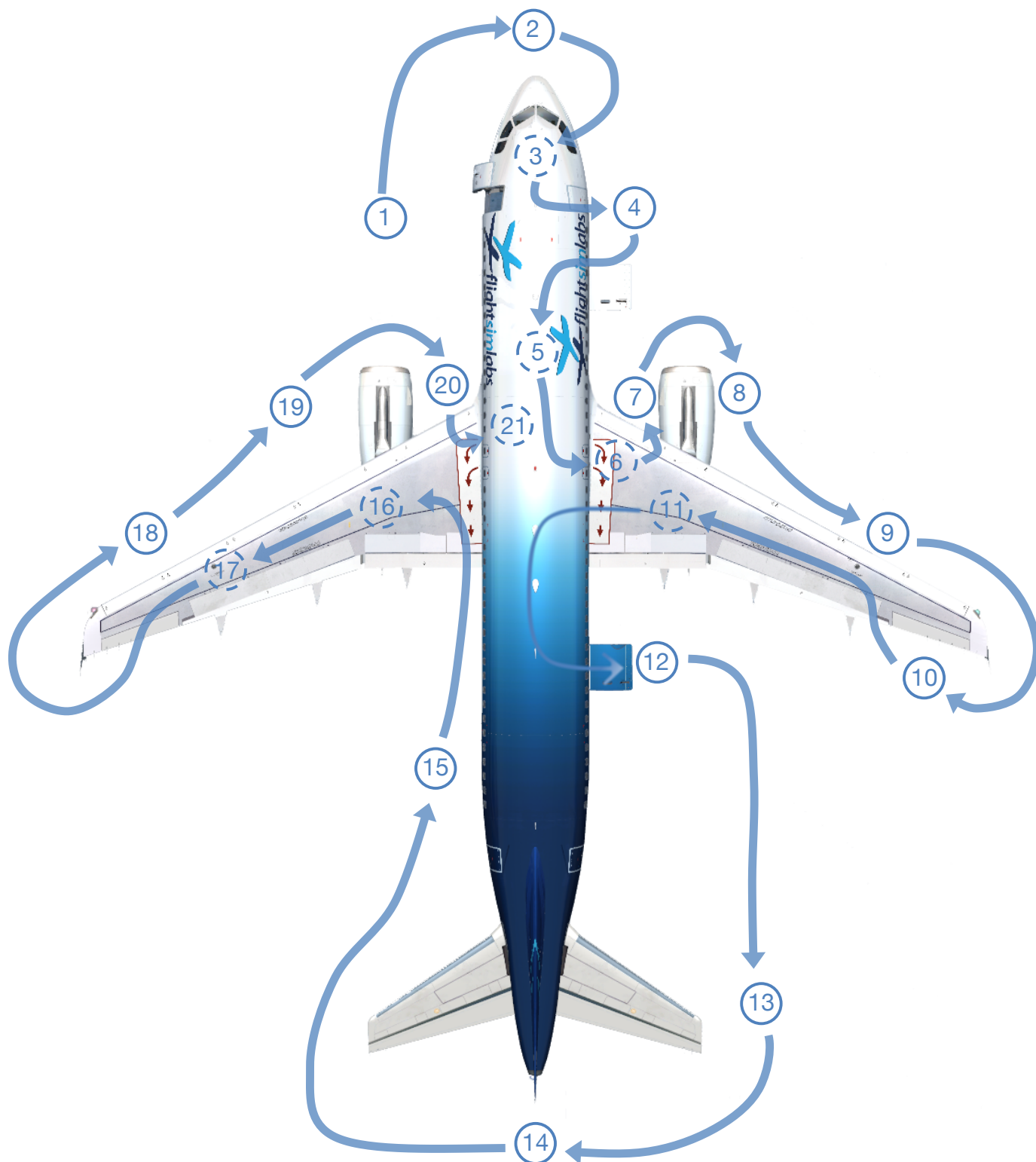
GEARS PINS AND COVERS

GEARS PINS and COVERS ----- CHECK

Check that three are on board and stowed.



EXTERIOR WALK-AROUND





Check for the following items during the walk-around:

1 LH FWD FUSELAGE

AOA probes	-----	CONDITION
F/O and CAPT static ports	-----	CLEAR
Avionics equipment vent air inlet valve	-----	CONDITION
Oxygen bay	-----	CLOSED
Oxygen overboard discharge indicator	-----	GREEN
Toilet servicing door	-----	CLOSED

2 NOSE SECTION

Pitot / TAT probes	-----	CONDITION
STBY static ports	-----	CLEAR
Radome and latches	-----	CONDITION/LATCHED
Forward avionics compartment door	-----	CLOSED

3 NOSE L/G

Nose wheel chocks	-----	IN PLACE
Wheels and tires	-----	CONDITION
Nose gear structure	-----	CONDITION
Taxi, TO, turn-off lights	-----	CONDITION
Hydraulic lines and electrical wires	-----	CONDITION
Wheel well	-----	CHECK
Safety pin	-----	REMOVED

4 RH FWD FUSELAGE

RH + AFT avionic compartment doors	-----	CLOSED
Avionic equipment vent air outlet valve	-----	CONDITION
F/O-CAPT static ports	-----	CLEAR
AOA probe	-----	CONDITION

5 LOWER CENTER FUSELAGE

Potable water drain panel	-----	CLOSED
Antennas / Drain mast	-----	CONDITION
RAM air inlet flap	-----	CONDITION
LP and HP ground connection doors	-----	CLOSED
Pack air intakes and outlets	-----	CLEAR

6 RH CENTER WING

Yellow hydraulic bay door	-----	CLOSED
Fuel panel	-----	CLOSED
Fuel water drain valve inner tank	-----	NO LEAK
Slat 1 / Landing light	-----	CONDITION

7 ENG 2 LH SIDE

Oil fill access door	-----	CLOSED
----------------------	-------	--------



Fan cowl doors ----- CLOSED/LATCHED
Drain mast ----- CONDITION/NO LEAK
Engine inlet and fan blades ----- CHECK

8 ENG 2 RH SIDE

Pressure-relief/Start valve handle access door ----- CLOSED
Turbine exhaust ----- CLEAR
Pylon/access panel ----- CONDITION/CLOSED

9 RH WING LEADING EDGE

Fuel water drain valve ----- NO LEAK
Refuel coupling ----- CLOSED
Surge tank air inlet ----- CLEAR
Fuel ventilation overpressure disc ----- INTACT
Slats / Wing tip ----- CONDITION

10 RH WING TRAILING EDGE

Static dischargers ----- CHECK
Flaps / Control surfaces ----- CONDITION

11 RH L/G AND FUSELAGE

Chocks ----- REMOVED
Wheels and tires ----- CONDITION
Brakes and brake wear ind ----- CONDITION
Hydraulic lines ----- CHECK
Landing gear structure ----- CHECK
Downlock springs ----- CHECK
Safety pin ----- REMOVED
Ground hydraulic connection yellow ----- CLOSED
Shroud fuel drain ----- CONDITION/NO LEAK

12 RH AFT FUSELAGE

Toilet service access door ----- CLOSED
Outflow valve ----- CONDITION
Drain mast ----- CONDITION
Flight recorder access door ----- CLOSED

13 TAIL

Stabilizer, elevator, fin, and rudder ----- CONDITION
Static dischargers ----- CHECK
Lower fuselage structure (tail impact on runway) ----- CONDITION

14 APU

Access doors ----- CLOSED
Air intake ----- CONDITION
Drain ----- CONDITION/NO LEAK



Exhaust ----- CLEAR
Fire extinguisher overpressure indication (red disc) ----- IN PLACE

15 LH AFT FUSELAGE

Stabilizer, elevator, fin, and rudder ----- CONDITION
Potable water service door ----- CLOSED
Ground hydraulic connection blue/green doors ----- CLOSED

16 LH LANDING GEAR

Chocks ----- REMOVED
Wheels and tires ----- CONDITION
Brakes and brake wear indicator ----- CONDITION
Hydraulic lines ----- CHECK
Landing gear structure ----- CHECK
Downlock springs ----- CHECK
Safety pin ----- REMOVED

17 LH WING TRAILING EDGE

Flaps / Control surfaces ----- CONDITION
Static dischargers ----- CHECK

18 LH WING LEADING EDGE

Slats / Wing tip ----- CONDITION
Surge tank air inlet ----- CLEAR
Fuel ventilation overpressure disc ----- INTACT
Fuel water drain valve ----- NO LEAK
Inner and outer cell magnetic fuel level ----- FLUSH

19 ENG 1 LH SIDE

Oil fill access door ----- CLOSED
Fan cowl doors ----- CLOSED/LATCHED
Drain mast ----- CONDITION/NO LEAK
Engine inlet and fan blades ----- CHECK

20 ENG 1 RH SIDE

Pressure relief/Start valve handle access door ----- CLOSED
Turbine exhaust ----- CLEAR
Pylon/access panel ----- CONDITION/CLOSED

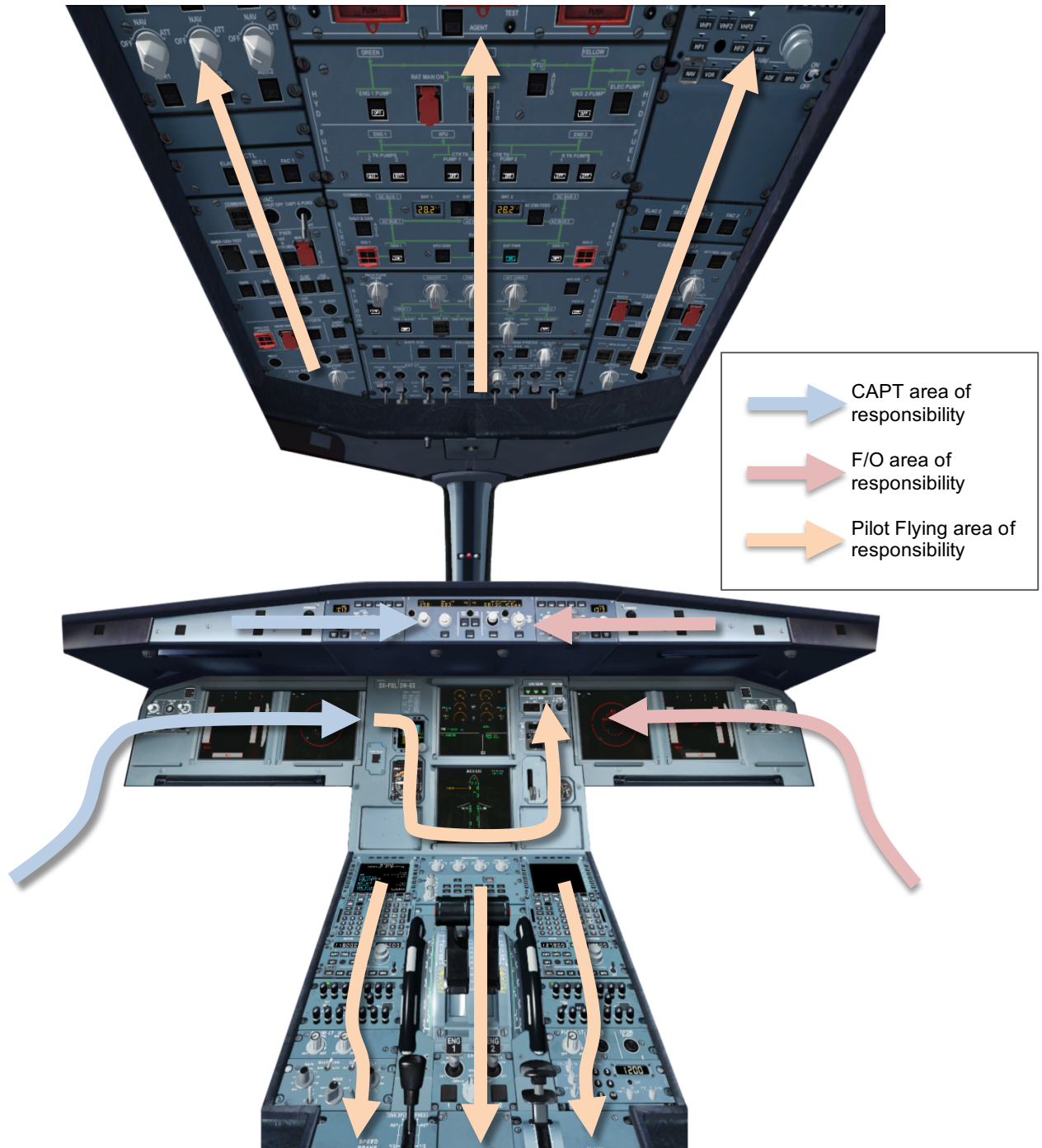
21 LH CENTER WING

Slat 1 / Landing lights ----- CONDITION
Wing leading edge ventilation intake ----- CLEAR
Fuel water drain valves ----- NO LEAK
Hydraulic reservoir and RAT door ----- CLOSED



COCKPIT PREPARATION

Panel Scan Sequence





OVERHEAD PANEL

WHITE LIGHTS ON OVERHEAD PANEL

During the scan sequence of the overhead panel:

ALL WHITE LIGHTS ----- EXTINGUISH

It is a general rule to turn off all the white lights during the scan sequence; therefore, these actions are not listed here.

ADIRS

- **If this is the first flight of the day, or there is a change in flight crew, or the GPS is not available and the flight crew expects long segments in poor NAVAIDS coverage:**

ALL IR MODE selector ----- NAV

This action launches a complete alignment of the ADIRS. Set the selectors to NAV at least 12min after aircraft power up. This is to avoid an incorrect date initialization.

- **For other flights, if the residual ground speed is greater than 5 kt:**

ALL IR MODE selector ----- OFF then NAV

Set the mode selectors back to NAV within 5 s to perform a fast alignment.

EXT LT

STROBE sw ----- AUTO

BEACON sw ----- OFF

REMAINING EXTERIOR LIGHTS ----- AS RQRD

SIGNS

SIGNS sw ----- ON/AUTO

EMER EXIT LT selector ----- ARM

CABIN PRESS

LDG ELEV knob ----- AUTO

AIR COND

PACK FLOW selector ----- AS RQRD

Select:

LO: If the number of passengers is below 115.

HI: For abnormally hot and humid conditions.

NORM: For all other normal operating cases.

If the APU is supplying, pack controllers select HI flow automatically, independent of the selector position. However the actual flow may be less than HI if lower flow is sufficient.



ELEC

ELEC pb (on the ECAM Control Panel) ----- PRESS
BAT 1 pb-sw and BAT 2 pb-sw ----- OFF then ON

This action initiates a charging cycle of the batteries.

10s after setting all BAT pb-sw ON, check on the ELEC SD page that the current charge of the battery is below 60 A, and is decreasing.

- **If the charge of at least one battery is not below 60 A:**

Wait until the end of the charging cycle of the batteries and perform this check again.

ENG 1 - ENG 2 FIRE

ENG 1 FIRE pb-sw and ENG 2 FIRE pb-sw ----- CHECK IN and GUARDED
AGENT 1 light and AGENT 2 light ----- CHECK OFF
ENG 1 TEST pb and ENG 2 TEST pb ----- PRESS and MAINTAIN

AUDIO SWITCHING PANEL

AUDIO SWITCHING selector ----- NORM

THIRD OCCUPANT AUDIO CONTROL PANEL

PA knob ----- RECEPT

- *This allows cabin attendant announcements to be recorded on the CVR.*

- *For proper recording, set volume at or above medium range.*

MAINTENANCE PANEL

ALL LIGHTS ----- CHECK OFF



CTR INSTRUMENT PANEL

CTR INSTRUMENT PANEL - ISIS

ISIS ----- CHECK

- Adjust brightness, check IAS, altimeter readings, altimeter settings and attitude display.
- Check no flags
- Reset attitude, if necessary.

CLOCK

CLOCK ----- CHECK and SET AS NECESSARY

If the date is incorrect, set the date manually then set and keep the clock mode to INT for the whole flight (Use P3D menus to adjust date and time).

NOSEWHEEL STEERING

A/SKID & N/W STRG sw ----- ON

PEDESTAL

WEATHER RADAR

Power supply sw ----- CHECK OFF
WINDSHEAR sw ----- CHECK OFF
GAIN knob ----- AUTO/CAL
MODE selector ----- AS RQRD

SWITCHING PANEL

All selectors ----- CHECK NORM

ECAM CONTROL PANEL

STS pb ----- PRESS

Check INOP SYS display.

If a message is displayed in MAINTENANCE STATUS, see PARKING procedure.

PRESS pb ----- PRESS

Check that the CAB PRESS page displays LDG ELEV AUTO, to confirm the correct position of the LDG ELEV knob.

ENG

THRUST lever ----- IDLE
ENG MASTER lever ----- OFF
ENG MODE selector ----- NORM

PARKING BRK

PARK BRK handle ----- ON



BRAKES PRESSURE ----- CHECK

Check for normal indication on the ACCU and BRAKES PRESS indicator.

➤ **If brakes are hot and chocks are in place:**

PARK BRK handle ----- OFF

This action increases the brake cooling.

GRAVITY GEAR EXTN

GRAVITY GEAR EXTN ----- CHECK STOWED

ATC

ATC ----- SET FOR OPERATION

Perform the appropriate ATC selection to allow the ATC transponder to operate in mode S, TCAS is on standby. To prevent possible interference to radar surveillance systems, TCAS should not be selected before the holding point/lining up.

ALT RPTG ----- ON

ATC SYS 1 ----- SELECT

*For RVSM operations select SYS 1 if AP 1 is used, and SYS 2 if AP 2 is used.
Only system 1 is available in emergency electrical configuration.*

RMP

RMP ----- ON

Green NAV light ----- CHECK OFF

SEL light ----- CHECK OFF

COM FREQUENCIES ----- TUNE

Use VHF 1 for ATC (only VHF 1 is available in emergency electrical configuration), VHF 2 for ATIS and company frequencies. VHF 3 is normally devoted to ACARS.

AIRFIELD DATA

AIR FIELD DATA ----- OBTAIN

The airfield data should include: RUNWAY IN USE, ALTIMETER SETTING, and WEATHER DATA.



FMGS INITIALIZATION

At electrical power-up, the FMGSs and FCU run through various internal tests. Allow approx. 3min for test completion and do not start to press buttons until the tests are over. If the "PLEASE WAIT" message appears, do not press any MCDU key until the message clears.

ENGINE & AIRCRAFT TYPE ----- CHECK
FM database validity ----- CHECK

- Press the DATA key, and display the STATUS page (if not displayed).
- Check DATA BASE validity

FLIGHT PLAN INITIALIZATION ----- COMPLETE

- Press the INIT key
- Insert CO RTE or city pair, and check FROM/TO
- Check/modify ALTN/CO RTE
- Enter flight number

Note: For ATC needs, the crew should enter the entire flight number as shown on the ICAO flight plan, without inserting any space, on the MCDU INIT page.

- Enter (and/or check) cost index
- Enter intended initial CRZ FL, or check if it was already supplied by the database. Modify if necessary, taking into account ATC constraints or expected gross weight
- Check and modify CRZ FL TEMP and tropopause level to agree with forecast
- Enter (and/or check) the expected ground temperature for take off (GND TEMP)
- PRESS IRS INIT prompt
- Check alignment latitude/longitude.

ADIRS POSITION INITIALIZATION ----- AS APPROPRIATE

- ADIRS position initialization involves setting the ADIRS navigation starting point. This only occurs for a complete or fast alignment. The ADIRS are automatically initialized using the GPS position, without pilot intervention.
- If the GPS position is not available, the crew manually initializes the ADIRS, by pressing the ALIGN ON REF prompt. This sends the coordinates displayed on the IRS INIT page to the three ADIRS.
- When performing a manual initialization, use the defaulted departure airport reference point coordinates or the gate coordinates

F-PLN A page ----- COMPLETE AND CHECK

The flight crew must check, modify, or insert (as applicable) the F-PLN in the following order, according to the data given by ATIS, ATC, or MET:

- Lateral revision at departure airport. Select RWY, then SID, then TRANS using scroll keys.
- Lateral revision at WPT for ROUTE modification if needed. (Refer to DSC-22_20-30-10-05 Lateral Revisions).
- Vertical revision. Check or enter climb speed limit, constraints according to ATC clearance. Enter step altitude as appropriate.

WINDS ----- AS APPROPRIATE

Choose between using trip wind and the forecast wind for CLB, CRZ and DES phases.

F-PLN ----- CHECK



- Check the F-PLN using F-PLN page and ND PLAN mode versus the computer (paper) flight plan or navigation chart.
- Check DIST TO DEST along the F-PLN. Compare it with the total distance computed for the flight with the computer (paper) flight plan.

SECONDARY FLIGHT PLAN ----- AS APPROPRIATE

This is routinely a copy of the active flight plan. However, consideration may be given to the following:

- Copy the active F-PLN, but modify it at a suitable WPT for an immediate return to the departure airfield in the event of, for example, engine failure*
- If weather is below landings minima at the departure airfield, the secondary flight plan should be that required for a diversion immediately after takeoff*
- If there is a chance of a change in runway or SID during taxi, prepare for it by copying the active flight plan and making the necessary modifications.*

RADIO NAV ----- CHECK

- Check the VOR, ILS and ADF tuned by the FMGC.
- Modify them if required, and check that the correct identifier is displayed on the ND and PFD.

FMGS DATA INSERTION

GROSS WEIGHT INSERTION (INIT B PAGE):

ZFW/ZFWCG ----- INSERT
BLOCK FUEL ----- INSERT

CAUTION The characteristic speeds displayed on the MCDU (green dot, F, S, VLS) are computed from the ZFW and ZFWCG entered by the crew on the MCDU. Therefore, this data must be carefully checked.

- The flight crew should insert the weights after completing all other insertions. This is to avoid cycles of prediction computations at each change in flight plan, constraints, etc.
- If ZFW and ZFWCG are unavailable, it is acceptable to enter the expected values in order to obtain predictions. Similarly, the flight crew may enter the expected fuel on board, if refueling has not been completed at that time.

TAKEOFF DATA INSERTION (PERF TAKEOFF PAGE):

V1, VR, V2 ----- INSERT
FLX TO TEMP ----- INSERT
THR RED/ACC altitude ----- SET or CHECK

For noise abatement procedure, the crew must set the acceleration altitude at or above 3 000 ft and adjust the values according to local noise abatement regulations.

ENG OUT ACC altitude ----- SET or CHECK
FLAPS/THS reminder ----- INSERT
TO SHIFT ----- AS RQRD

Enter the takeoff SHIFT distance, if takeoff is to be from an intersection. This is essential for position updating at takeoff and, consequently, for navigation accuracy.



CLIMB, CRUISE, DESCENT, SPEED PRESELECTION

PRESET SPEEDS ----- AS RQRD

If the flight is cleared for a close-in turn or close-in altitude constraint, the flight crew may preselect green dot speed on the PERF CLB page. Once the CLB phase is active, the preselected speed will be displayed in the FCU speed window and on the PFD (blue symbol). Once the turn is completed or the altitude cleared, the pilot will resume the managed speed profile by pressing the SPD selector on the FCU.

Similarly the pilot may select a CRZ MACH number on the PERF CRZ page (constant CRZ Mach segment, for example). When the CRZ phase is active, the preselected CRZ MACH number will be displayed in the FCU speed window and on the PFD. When ECON MACH number may be resumed, the crew presses the FCU SPD selector.

In either of the above cases, the pilot may cancel the CLB or CRZ preselected SPD/MACH prior to activating the related phase, by selecting ECON on the PERF CLB or CRZ pages.

SPD LIM is defaulted to 250 kt below 10 000 ft in the managed speed profile. This may be either cleared or modified on the VERT REV page at the origin (or a climb waypoint).

GLARESHIELD

LIGHTING

GLARESHIELD INTEGRAL LIGHT selector and FLOOD LIGHT ----- AS RQRD

EFIS CONTROL PANEL

BARO REF ----- SET and CHECK

- Set QNH on the EFIS control panel and on the standby altimeter
- Check barometer settings and altitude indications on the PFD and standby altimeter

FD ----- CHECK ON

LS ----- AS RQRD

ND MODE and RANGE ----- AS RQRD

MODE : Display the ARC mode on the ND if the takeoff direction is approximately the departure direction, or the ROSE NAV mode if the direction change is to be more than 70 ° after takeoff (to allow the ND to display the area behind the aircraft).

RANGE : Set the minimum range to display the first waypoint after departure, or as required for weather radar.

ADF/VOR sw ----- AS RQRD

FCU

SPD MACH window ----- DASHED

HDG V/S -TRK FPA pb ----- HDG V/S

ALT window ----- INITIAL EXPECTED CLEARANCE ALT



CM 1/2 INSTRUMENT PANELS

PFD and ND brightness knob ----- AS RQRD

Check the ND outer ring to maximum range (radar display).

PFD ----- CHECK

- Check PFD/ND not transferred.
- Check for correct display, when ATT and HDG are available.
- Check IAS, FMA, initial target ALT, altimeter readings, VSI, altimeter settings, heading and attitude display.

ND ----- CHECK

- Check for correct display.
- Crosscheck compass indication on the ND and DDRMI.
- Check ground speed less than 5 kt, heading, initial waypoint, VOR ADF indications.

SIDE CONSOLES

OXYGEN MASK TEST

➤ On the OXYGEN panel:

CREW SUPPLY pb ----- CHECK ON

➤ On the glareshield:

LOUDSPEAKERS ----- ON

➤ On the audio control panel:

INT reception knob ----- PRESS OUT - ADJUST
INT/RAD sw ----- INT

➤ On the mask stowage box:

- Press and hold the reset/test button in the direction of the arrow.
 - Check that the blinker turns yellow for a short time, and then goes black.
- Hold the reset/test button down, and press the emergency pressure selector.
 - Check that the blinker turns yellow and remains yellow, as long as the emergency pressure selector is pressed.
 - Listen for oxygen flow through the loudspeakers.
- Check that the reset/test button returns to the up position.
- Press the emergency pressure selector again, and check that the blinker does not turn yellow. This ensures that the mask is not supplied.

➤ On the ECAM DOOR/OXY page:

REGUL LO PR message ----- CHECK OFF

This check ensures that the LP valve is open.

(Due to residual pressure between the LP valve and the oxygen masks, an LP valve failed in the closed position may not be detected during the oxygen mask test)



FMGS DATA CONFIRMATION

AIRFIELD DATA ----- CONFIRM
ATC CLEARANCE ----- OBTAIN
IRS ALIGN ----- CHECK

On the POSITION MONITOR page, check that the IRS are in NAV mode, and check that the distance between each IRS and the FMS position is lower than 5 nm. Select ND in ROSE-NAV or ARC mode, and confirm that the aircraft position is consistent with the position of the airport, the SID and the surrounding NAVAIDs.

GROSS WEIGHT INSERTION..... CHECK

The PNF checks FMGS data.

TO DATA ----- CALCULATE/CHECK

The PNF calculates and checks takeoff data.

F-PLN A page ----- CHECK

- Select the EFIS CSTR pushbutton switch on.
- Ensure that the inserted F-PLN agrees with planned routes. Refer to PRO-NOR-SRP-01-10 FMGS Initialization
- Use the scroll key to check the whole F-PLN thoroughly, using ND in PLAN mode as necessary. Tracks and distances between waypoints are displayed on the second line from the top of the MCDU. SID and EOSID tracks and distances must be checked from the appropriate navigation charts.
- Check speed and altitude constraints. Add new speed or altitude constraints if required.



ATC

TRANSPONDER CODE ----- SET

FUEL

FUEL QTY ----- CHECK

- Check that ECAM fuel on board corresponds to the F-PLN.
- Check that fuel imbalance is within limits.
- Crosscheck the sum of the Fuel On Board (FOB) recorded at the end of the last flight and the fuel uplift (if any) is consistent with the current FOB. If an abnormal discrepancy is found, a maintenance action is due.

TAKEOFF BRIEFING

TAKEOFF BRIEFING.....PERFORM



BEFORE START CLEARANCE

LOADSHEET ----- CHECK
TAKEOFF DATA ----- PREPARE and CHECK/REVISE

- The PF checks (or revises) the takeoff data in the INIT B and PERF pages of the MCDU.

SEATS, SEAT BELTS, HARNESSSES, RUDDER PEDALS, ARMRESTS ----- ADJUST

The seat is correctly adjusted, when the pilot's eyes are in line with the red and white balls.

MCDU ----- IN TAKEOFF CONFIGURATION

It is recommended that the crew display F-PLN on the PNF side, and PERF TAKEOFF on the PF side.

EXT PWR ----- CHECK OFF

Request that external power be removed.

BEFORE START CHECKLIST down to the line ----- COMPLETE

AT START CLEARANCE

PUSHBACK/START UP CLEARANCE ----- OBTAIN

Obtain ATC pushback/startup clearance.

Obtain ground crew clearance.

NW STRG DISC ----- CHECK AS RQRD

In case of pushback (conventional or towbarless), the nosewheel steering selector bypass pin must be in the tow position. The ECAM 's NW STRG DISC, or N WHEEL STEERG DISC memos indicate this to the flight crew.

WINDOWS and DOORS ----- CHECK CLOSED

- To ensure that the sliding window is correctly closed and locked, push the handle of the sliding window fully forward to the closed position, and check that the red indicator is visible

- Check, on the ECAM lower display, that all the aircraft doors are closed

BEACON sw ----- ON

THR LEVERS ----- IDLE

PARKING BRAKE ACCU PRESS indicator ----- CHECK

The ACCU PRESS indicator must be in the green band.

PARKING BRAKE ----- AS RQRD

If no pushback is required, check that the PRK BRK handle is ON, and check the BRAKES PRESS indicator

If pushback is required, set the PRK BRK handle to OFF.

CAUTION Do not use brakes during pushback, unless required due to an emergency.

After pushback is completed, set the PRK BRK handle to ON and inform the ground crew.

BEFORE START CHECKLIST below the line ----- COMPLETE



AUTOMATIC ENGINE START

Use the automatic engine start procedure in most circumstances. However, if the start aborts due to insufficient starter inlet air pressure (e.g. on high airfields, or in case of low pressure from an external pneumatic power group), it is recommended to use the manual start procedure.

If, during the engine start, the ground crew reports a fuel leak from the engine drain mast, run the engine at idle for 5 min. If the leak disappears during these 5 min, the aircraft can be dispatched without maintenance action. If the leak is still present after 5 min, maintenance action may be required before the flight.

ENG MODE selector ----- IGN/START

The lower ECAM displays the ENG SD page.

START ENGINE 2 ----- ANNOUNCE

Engine 2 is usually started first. It powers the yellow hydraulic system, that pressurizes the parking brake.

ENG 2 MASTER sw ----- ON

- Do not turn the ENG 2 MASTER sw ON before all amber crosses and messages have disappeared on the engine parameters (upper ECAM display).
- Parameter callouts are not mandatory.
- In case the electrical power supply is interrupted during the start sequence (indicated by the loss of ECAM DUs), abort the start by switching OFF the ENG 2 MASTER sw. Then perform a 30s dry crank.

ON UPPER ECAM DISPLAY	ON LOWER ECAM DISPLAY
N2 increases	Corresponding start valve in line. Bleed pressure indication green. Oil pressure increases.
At 16% N2	Indication of the active igniter (A or B).
At 22% N2 - FF increases 15s (maximum) after fuel is on - EGT increases - N1 increases	
At 50% N2 (CFM) At > 43% N2 (IAE)	Start valve starts closing. (It is fully closed between 50% and 56% N2). Igniter indication off.



➡ **When idle is reached (AVAIL indication is displayed):**

MAIN AND SECONDARY ENG. IDLE PARAMETERS ----- CHECK NORMAL

	CFM Engines	IAE Engines
At ISA sea level :	N1 about 19.5 % N2 about 58.5 % EGT about 390 °C FF about 275 kg/h	EPR about 1.01 N1 about 21.4 % N2 about 57.8 % EGT about 414 °C FF about 350 kg/h
Grey background on N2 indication disappears.		

START ENGINE 1 ----- ANNOUNCE
ENG 1 MASTER sw ----- ON

Same procedure as for engine 2.

Both pack valves reopen with 30s delay after the second engine N2 is above 50 %.

Note: A PTU FAULT is triggered, if the second engine is started within 40 s following the end of the cargo doors operation



AFTER START

ENG MODE selector ----- NORM

*Turning the ENG MODE selector to NORM indicates the end of the start sequence.
Leaving the ENG MODE selector at the START/IGN position would prevent continuous relight selection on the ground (would be supplied at lift off). The selector must be cycled to recover normal control of ignition and to display WHEEL SD page.*

After start, to avoid thermal shock, the pilot should operate the engine at idle or near idle for at least 2 min before advancing the thrust lever to high power. Taxi time at idle may be included in the warm-up period.

The last engine started must run for at least 2 min before takeoff initiation, to ensure that takeoff is not initiated before the center tank pumps test is finished, since takeoff on center tank is prohibited.

APU BLEED pb-sw ----- OFF

- Turn APU BLEED pb-sw off just after engine start to avoid ingestion of engine exhaust gases.
- APU BLEED valve closes, ENG BLEED valves open.

ENG 1 / 2 ANTI ICE pb-sw ----- AS RQRD

Note: Icing conditions may be expected when the OAT (on ground and for takeoff), or the TAT (in flight), is 10 °C or below, and there is visible moisture in the air (such as clouds, fog with low visibility, rain, snow, sleet, ice crystals), or when standing water, slush, ice or snow is present on the taxiways or runway.

During ground operation, when in icing conditions for more than 30 min, the following procedure should be applied for ice shedding :

If ground surface conditions and the environment permit, the flight crew should accelerate the engines to approximately 70 % of N1 for 30 s at intervals not greater than 30 min.

In addition, this engine acceleration should also be performed just before take-off, with particular attention to engine parameters to ensure normal engine operation. If ground surface or environment do not permit to accelerate the engine to 70 % N1, then power setting and dwell time should be as high as practical.

When operating in conditions of freezing rain, freezing drizzle, freezing fog or heavy snow, ice shedding may be enhanced, by additional run ups at intervals, to not exceed 10 min, advancing throttles to 70 % N1 momentarily (no hold time).

WING ANTI ICE pb-sw ----- AS RQRD

When Wing Anti-Ice pb-sw is switched on, on the ground, the anti-ice valves open for about 30 s (test sequence), then close as long as the aircraft is on ground.

APU MASTER pb-sw (if APU not required) ----- OFF

AVAIL light goes off after APU cooling period.

GROUND SPOILERS ----- ARM

RUD TRIM ----- ZERO

If RUD TRIM position indication is not at zero, press the RESET pb.

FLAPS lever ----- SET

- Set flaps for takeoff



- Check their position on the ECAM upper display
- If taxiing in slush, keep the flaps retracted until reaching the holding point.

PITCH TRIM handwheel ----- SET

Set takeoff CG on pitch trim handwheel.

DOOR/OXY SD page ----- SELECT

- Check that all slides are armed
- Deselect the DOOR/OXY SD page after verifying the slides.

ECAM STATUS ----- CHECK

- If STS is displayed, press the STS key and review the ECAM Status page.

CLEAR TO DISCONNECT ----- ANNOUNCE

AFTER START CHECK LIST ----- COMPLETE



TAXI

TAXI clearance ----- OBTAIN
NOSE light ----- TAXI

*Turn on the nosewheel light to TAXI day and night.
RWY TURN OFF lights may be switched ON, as required.*

PARK BRK handle ----- OFF

Check that brake pressure is zero.

ELAPSED TIME ----- AS RQRD

If ACARS is not installed, start ELAPSED TIME to record block time.

THRUST LEVERS ----- AS RQRD

- Little, if any, power above idle thrust will be needed to get the aircraft moving (40 % N1 maximum). Thrust should normally be used symmetrically. Once the aircraft starts to move, little thrust is required.
- Use of the engine anti-ice increases ground idle thrust, so the pilot must use care on slippery surfaces
- The engines are close to the ground. Avoid positioning them over unconsolidated, or unprepared ground (beyond the edge of the taxiways, for example). Avoid high thrust settings at low ground speeds, which increase the risk of ingestion (FOD), and the risk of projection of debris towards the trimmable horizontal stabilizer and elevators.

BRAKES ----- CHECK

➤ **Once the aircraft starts moving:**

Check the brake efficiency of the normal braking system: The aircraft must slow down when pressing the brake pedals.

- **If an arc is displayed on the WHEEL SD page, above the brake temperature:**
Set the brake fans on.

FLIGHT CONTROLS ----- CHECK

1. At a convenient stage, prior to or during taxi, and before arming the autobrake, the PF silently applies full longitudinal and lateral sidestick deflection.

On the F/CTL SD page, the PNF checks full travel and the correct sense of all elevators and all ailerons, and the correct deflection and retraction of all spoilers.

Note: In order to reach full travel, full sidestick must be held for a sufficient period of time.

2. The PF presses the PEDALS DISC pb on the nosewheel tiller, and silently applies full left rudder, full right rudder, and neutral.

Note: The F/CTL SD page is automatically displayed for 20 s.

ATC clearance ----- CONFIRM

AFS/FLIGHT INSTRUMENTS

F-PLN (SID,TRANS) ----- REVISE or CHECK

Carefully confirm that the ATC clearance agrees with the FMGS, if NAV mode is to be used.



INITIAL CLIMB SPEED AND SPEED LIMIT ----- MODIFY or CHECK

Use VERT REV at departure, or at a CLB waypoint.

CLEARED ALTITUDE ON FCU ----- SET
HDG ON FCU ----- IF REQUIRED, PRESET

If a heading is required by the ATC after takeoff, in case of a radar vector departure, preset the heading on the FCU. NAV mode will be disarmed.

RWY TRK mode will keep the aircraft on the runway track.

FD ----- CHECK BOTH SELECTED ON
FMA ----- CHECK
FLIGHT INSTRUMENTS ----- CHECK
RADAR (if required) ----- ON
PREDICTIVE WINDSHEAR SYSTEM ----- AUTO

ATC code ----- CONFIRM/SET
TERR ON ND ----- AS RQRD

- In mountainous areas, consider displaying terrain on ND.

- If use of radar is required, consider selecting the radar display on the PF side, and TERR ON ND on the PNF side only.

AUTO BRK ----- MAX

- ON light comes on

- Autobrake may be armed, with the parking brake on

- In the event of an aborted takeoff, selecting the MAX mode before takeoff improves safety.

If the takeoff must be aborted, the autobrake system applies maximum braking as soon as the thrust levers are set to idle, if the ground speed is above 72 kt.

TAKEOFF BRIEFING ----- CONFIRM
CABIN REPORT ----- RECEIVE
TO CONFIG pb ----- PRESS

Check that ECAM upper display shows "TO CONFIG NORMAL".

TO MEMO ----- CHECK NO BLUE LINE
BEFORE TAKEOFF CHECKLIST down to the line ----- COMPLETE



BEFORE TAKEOFF

TAKEOFF OR LINE UP CLEARANCE ----- OBTAIN
TCAS Mode selector ----- TA or TA/RA

The flight crew should use the TA/RA mode as the default mode of the TCAS.

APPROACH PATH CLEAR OF TRAFFIC ----- CHECK

Check that the approach path is clear of traffic, visually and using TCAS display on ND.

PACK 1 and 2 ----- AS RQRD

Consider selecting packs OFF, or APU bleed ON.

This will improve performance when using TOGA thrust.

In case of a FLEX takeoff, selecting packs OFF or APU bleed ON will reduce takeoff EGT, and thus reduce maintenance costs.

The use of flex thrust may reduce maintenance costs. The effect is particularly significant with the first degrees of FLEX.

Use of APU bleed is not authorized, if wing anti-ice is to be used.

EXTERIOR LIGHTS ----- SET

Set RWY TURN OFF, L and R LAND and NOSE at ON/TO in order to minimize bird strike hazard during takeoff.

Set the STROBE to ON, before entering the runway.

TAKEOFF RUNWAY ----- CONFIRM

Confirm that the line up is performed on the intended runway. Useful aids are:

- The runway markings,
- The runway lights,

Be careful that in low visibility, edge lights could be mixed up with the center line lights.

- The ILS signal,

If the runway is ILS equipped, the flight crew can press the ILS pb (or LS pb): The LOC deviation should be centered after line up.

- The runway symbol on the ND

SLIDING TABLE ----- STOW

➡ **If the brake fans are running:**

BRAKE TEMP ----- CHECK

- If brake temperature is above 150 °C, delay takeoff.
- If brake temperature is below 150 °C, select brake fans off.

ENG MODE selector ----- AS RQRD

Select IGN, if:

- The runway has standing water, or
- Heavy rain is falling, or
- Heavy rain or severe turbulence is expected after takeoff.

CABIN CREW ----- ADVISE

BEFORE TAKEOFF CHECKLIST below the line ----- COMPLETE



TAKEOFF

Rolling takeoff is permitted.

TAKEOFF ----- ANNOUNCE
BRAKES ----- RELEASE

THRUST SETTING

➤ If the crosswind is at or below 20kts and no tailwind:

THRUST LEVERS ----- FLX or TOGA

- To counter the nose-up effect of setting engine takeoff thrust, apply half forward stick until the airspeed reaches 80 kt. Release the stick gradually to reach neutral at 100kts.
- PF progressively adjusts engine thrust in two steps:
 - from idle to about 50% N1 (1.05 EPR).
 - from both engines at similar N1 to takeoff thrust.

➤ In case of tailwind or if crosswind is greater than 20kts:

THRUST LEVERS ----- FLX or TOGA

- PF applies full forward stick.
- PF sets 50% N1 (1.05 EPR) on both engines then rapidly increases thrust to about 70% N1 (1.15 EPR) then progressively to reach takeoff thrust at 40kts ground speed, while maintaining stick full forward up to 80kts. Release stick gradually to reach neutral at 100kts.
- Once the thrust levers are set to FLX or TOGA detent, the captain keeps his hand on the thrust levers until the aircraft reaches V1.

DIRECTIONAL CONTROL ----- USE RUDDER

At 130 kt (wheel speed), the connection between nosewheel steering and the rudder pedals is removed. Therefore, in strong crosswinds, more rudder input will be required at this point to prevent the aircraft from turning into the wind.

CHRONO ----- START

PFD/ND ----- SCAN

1. Check the FMA on the PFD. The following modes are displayed:
MAN FLX xx (or MAN TOGA) / SRS/RWY (or blank) / A/THR (in blue).

MAN	SRS			
FLX +55	CLB	NAV		1 FD 2
				A/THR

Note: If an ILS that corresponds to the departure runway is tuned, RWY mode appears. If not, no lateral mode appears until the aircraft lifts off.

2. Check the FMS position on the ND (aircraft on runway centerline).

BEFORE REACHING 80KTS

TAKEOFF N1 ----- CHECK

Check that the actual N1 of the individual engines has reached the N1 rating limit, before the aircraft reaches 80 kt. Check EGT.



THRUST SET ----- ANNOUNCE
PFD and ENG indications ----- SCAN

Scan airspeed, N1, and EGT throughout the takeoff.

REACHING 100KTS

ONE HUNDRED KNOTS ----- ANNOUNCE

- The PF crosschecks and confirms the speed indicated on the PFD
- Below 100kts the Captain may decide to abort the takeoff, depending on the circumstances
- Above 100kts, rejecting the takeoff is a more serious matter.

AT V1

V1 -----ANNOUNCE

AT VR

ROTATION ----- ANNOUNCE / PERFORM

- At VR, initiate the rotation to achieve a continuous rotation with a rate of about 3 °/s, towards a pitch attitude 15 ° (12.5 °, one engine is failed)
- Minimize the lateral inputs on ground and during the rotation, to avoid spoiler extension
- In strong crosswind conditions, small lateral stick inputs may be used, if necessary, to aim at maintaining wings level
- After lift-off, follow the SRS pitch command bar.

CAUTION If a tail strike occurs, avoid flying at an altitude requiring a pressurized cabin, and return to the originating airport for damage assessment.

WHEN POSITIVE CLIMB

POSITIVE CLIMB ----- ANNOUNCE

LDG GEAR ----- SELECT UP

AP ----- AS RQRD

Above 100 ft AGL, AP 1 or 2 may be engaged.

FMA ----- CHECK

AT THRUST REDUCTION ALTITUDE

THRUST LEVERS ----- CL

Move the thrust levers to the CL detent, when the flashing LVR CLB prompt appears on the FMA. A/THR is now active.

In manual flight, the pilot must anticipate the change in pitch attitude in order to prevent the speed from decaying when thrust is reduced.

FMA ----- CHECK

PACK 1 and 2 (if applicable) ----- ON

Select PACK 1 on after CLB thrust reduction.

Select PACK 2 on after flap retraction.



Note: 1. Selecting pack on before reducing takeoff thrust would result in an EGT increase.

AT ACCELERATION ALTITUDE

FMA ----- ANNOUNCE

Check the target speed change from $V_2 + 10$ to the first CLB speed (either preselected or managed).

Note:

1. When THR RED and ACC ALT are equal, the FMA will change from MAN FLX/SRS/NAV to THR CLB/CLB/NAV.

THR CLB	CLB	NAV	AP1
	ALT		1 FD 2
			A/THR

2. If FCU-selected altitude is equal to or close to the acceleration altitude, then the FMA will switch from SRS to ALT.*

ABOVE ACCELERATION ALTITUDE / IN CLIMB PHASE

The following procedure ensures that the aircraft is effectively accelerating toward climb speed.

➤ At F speed:

Note: For takeoff in CONF 1 + F, "F" speed does not appear.

FLAPS 1 ----- SELECT

➤ At S speed:

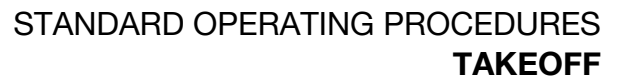
FLAPS ZERO ----- SELECT

GRND SPLRS ----- DISARM

EXTERIOR LIGHTS ----- SET

Set the NOSE and RWY TURN OFF switch to OFF.

Keep the LAND switch at ON according to airline policy or regulatory recommendations.





AFTER TAKEOFF

APU BLEED pb ----- AS RQRD

If the APU has been used to supply air conditioning during takeoff, set the APU BLEED pb to OFF.

APU MASTER SW pb ----- AS RQRD

ENG MODE selector ----- AS RQRD

Select IGN, if severe turbulence or heavy rain is encountered.

TCAS Mode selector ----- TA/RA

Select TA/RA if the takeoff has been performed with TA only.

ANTI ICE ----- AS RQRD

ENG ANTI ICE should be ON, when icing conditions are expected with a TAT at, or below, 10°C.



CLIMB

Normal vertical mode is CLB or OP CLB with managed speed active.

PF MCDU ----- PERF CLB

- PF MCDU should be showing the PERF CLB page
- The MCDU PROG page displays OPT FL and MAX REC FL. It is worth noting that this OPT FL is a function of the cost index (CI).

PNF MCDU ----- F-PLN

PNF MCDU should be showing the F-PLN page

CLIMB SPEED MODIFICATIONS

➤ If ATC, turbulence or operational considerations lead to a speed change:

Select the new speed with FCU SPD knob and pull.
Speed target is now “selected”.

To return to managed speed mode, push FCU SPD knob.
The speed target is now “managed”.

Note: The best speed (and rate of climb) for long-term situations lies between green dot speed and ECON speed. At high altitude, acceleration from green dot to ECON speed can take a long time.

EXPEDITE CLIMB

➤ If ATC requires a rapid climb through a particular level:

Push the EXP pb on the FCU.

The target speed is now green dot speed. : THR CLB / EXP CLB / NAV

THR CLB	EXP CLB ALT	NAV		AP1 1 FD 2 A/THR
---------	----------------	-----	--	------------------------

Note: Use EXP only for short-term tactical situations. For the best overall economy fly at ECON IAS.

To return to ECON CLB speed:

Push ALT knob.

Check FMA: THR CLB / CLB / NAV

THR CLB	CLB ALT	NAV		AP1 1 FD 2 A/THR
---------	------------	-----	--	------------------------

BARO REF ----- SET

At transition altitude (baro setting flashing on PFD) set STD on the EFIS control panel and standby altimeter.

Cross-check baro settings and altitude readings.

CRZ FL ----- SET AS RQRD

- If ATC clears the aircraft to its intended CRZ FL or above, there is no need to modify the



CRZ FL entered in the INIT A page during cockpit preparation. The FCU will automatically take into account a higher CRZ FL selected with the FCU ALT knob.

- If ATC limits CRZ FL to a lower level than the one entered in the INIT A page (or present on the PROG page) the flight crew must insert this lower CRZ FL in the PROG page. Otherwise there is no transition into CRZ phase: the managed speed targets and Mach are not modified, and SOFT ALT mode is not available. In that case FMA will display: MACH / ALT / NAV instead of MACH / ALT CRZ / NAV.

MACH	ALT	NAV		AP1 1 FD 2 A/THR
------	-----	-----	--	------------------------

ANTI ICE ENG 1 pb and ANTI ICE ENG 2 pb ----- AS RQRD

ENG ANTI ICE should be ON when the aircraft encounters icing conditions, unless the SAT is below -40°C.

RADAR TILT ----- ADJUST

AT 10.000FT

LAND lights ----- RETRACT

SEAT BELTS ----- AS RQRD

EFIS option ----- AS RQRD

Select CSTR on one side, for grid MORA, and ARPT on the other side.

ECAM MEMO ----- REVIEW

RAD NAV page ----- CHECK

Clear manually tuned VORs from MCDU RAD NAV page.

SEC F-PLN page ----- AS RQRD

Recopy the active flight plan in the secondary if an immediate return flight plan has been constructed previously.

OPT/MAX ALT ----- CHECK



CRUISE

ECAM MEMO ----- REVIEW
ECAM SYS PAGES ----- REVIEW

Periodically review system display pages and, in particular:

ENG: Oil pressure and temperature

BLEED: BLEED parameters

ELEC: Parameters, GEN loads

HYD: A slight decrease in quantity is normal.

Green system is lower than on ground, following landing gear retraction.

FUEL: Fuel distribution.

COND: Duct temperature, compared with zone temperature.

Avoid large differences for passenger comfort.

FLT CTL: Note any unusual control surface position.

FLIGHT PROGRESS ----- CHECK

Monitor flight progress in the conventional way.

When overflying a waypoint:

- Check track and distance to the next waypoint.

When overflying the waypoint, or every 30 min:

- Check FUEL : Check FOB (ECAM), and fuel prediction (FMGC), and compare with the computer flight plan.

Check that the sum of the fuel on board and the fuel used is consistent with the fuel on board at departure. If the sum is unusually greater than the fuel on board at departure, suspect a frozen fuel quantity indication. Maintenance action is due before the next flight. If the sum is unusually smaller than the fuel on board at departure, or if it decreases, suspect a fuel leak.

CAUTION *This check must also be performed each time a FUEL IMBALANCE procedure is necessary. Perform the check before applying the FUEL IMBALANCE procedure. If a fuel leak is confirmed, apply the FUEL LEAK procedure.*

STEP FLIGHT LEVEL -----AS APPROPRIATE
NAVIGATION ACCURACY ----- CHECK

On aircraft equipped with GPS primary, no navigation accuracy check is required, as long as GPS PRIMARY is available.

Otherwise, navigation accuracy must be monitored, at all times but especially when any of the following occurs:

- IRS only navigation.

- The PROG page displays LOW accuracy.

- "NAV ACCUR DOWNGRAD" appears on the MCDU.

RADAR TILT ----- ADJUST
CABIN TEMP ----- MONITOR

Pay regular attention to the CRUISE SD Page, in order to monitor passenger cabin temperatures and adjust them as necessary.



DESCENT PREPARATION

Descent preparation and approach briefing can take approximately 10 min, so they should begin approximately 80nm before top of descent.

LDG ELEV ----- CHECK

Check on ECAM CRUISE page that LDG ELEV AUTO is displayed.

WEATHER AND LANDING INFORMATION ----- OBTAIN

Check weather reports at ALTERNATE and DESTINATION airports. Airfield data should include runway in use for arrival.

LANDING PERFORMANCE ----- CONFIRM
ARRIVAL page ----- COMPLETE/CHECK

Insert APPR, STAR, APPR VIA and TRANS if applicable. (Access by lateral revision at destination.)

F-PLN A page ----- CHECK

- Ensure that the inserted F-PLN agrees with planned approach and missed approach.
- Use the scroll key to check the F-PLN thoroughly, using ND in PLAN mode as necessary. Tracks and distances between waypoints are displayed on the second line from the top of the MCDU. Approach and Missed Approach tracks and distances must be checked from the appropriate navigation charts.
- Check speed and altitude constraints. Add new speed or altitude constraints if required.
- Do not modify the final approach (FAF to runway or MAP), including altitude constraints.
- Identify the position and the altitude of Final Descent Point (FDP) and check the value of the FPA after this FDP.
- Identify the Missed Approach Point.

DES WIND ----- CHECK

Enter winds for descent starting at cruise flight level.

PERF CRUISE page ----- CHECK

Modify the cabin descent rate if different pressure rate is required.

PERF DES page ----- CHECK

Check ECON MACH/SPD. If a speed other than ECON is required, insert that MACH or SPD into the ECON field. This new MACH or SPD is now the one for the descent path and T/D computation, and it will be used for the managed speed descent profile (instead of ECON).

A speed limit of 250 kt below 10 000 ft is the defaulted speed, in the managed speed descent profile. The flight crew may delete or modify it if necessary on the VERT REV at DEST page.

PERF APPR page ----- COMPLETE/CHECK

Enter the QNH, temperature, and wind at destination.

Note: Insert the average wind given by the ATC or ATIS. Do not insert the gust value. During approach, the Ground Speed Mini function (manage speed mode) takes into account the instantaneous gust.



Insert the minimum.

Note:

-To avoid undershooting the published minimum during go-around, due to aircraft inertia during pull-up, some Authorities may require Operators to add a specific number of feet to the published minimum.

- Changing the RWY or type of approach automatically erases the previous minimums.

Note: After the activation of the SEC F-PLN, check the VAPP, and modify if necessary.

Check or modify the landing configuration. Always select the landing configuration on the PERF APP page: CONF FULL in the normal landing configuration. CONF 3 should be considered, depending on the available runway length and go-around performance, or if windshear/severe turbulence is considered possible during approach.

Check or modify the transition altitude.

GO-AROUND page ----- CHECK/MODIFY

Check THR RED ALT and ACC ALT, and modify, if necessary.

RAD NAV page ----- CHECK

Set nav aids, as required, and check ident on the NDs (VOR-ADF) and PFDs (ILS). If a VOR/DME exists close to the airfield, select it and enter its ident in the BRG/DIST field of the PROG page, for NAV ACCY monitoring during descent.

SEC F-PLN page ----- AS RQRD

Before the top of descent, the SEC F-PLN should either be set to an alternate runway for destination, or to the landing runway in case of circling. In all cases, routing to the alternate should be available.

GPWS LDG FLAP 3 pb-sw ----- AS RQRD

If the pilot plans on landing in FLAPS 3 configuration, the GPWS LDG FLAP 3 pb-sw should be set to ON.

APPROACH BRIEFING ----- PERFORM

AUTO BRK ----- AS RQRD

Use of autobrake is preferable.

Use of MAX mode is not recommended at landing.

On short or contaminated runways, use MED mode.

On long runways, LO mode is recommended.

Note: If, on very long runways, the flight crew anticipates that braking will not be needed, use of the autobrake is not necessary.

DESCENT CLEARANCE ----- OBTAIN

When clearance is obtained, set the ATC-cleared altitude (FL) on the FCU

ANTI ICE ----- AS RQRD

During descent, ENG ANTI ICE must be ON when icing conditions are encountered.

When ENG ANTI ICE is ON, the FADEC selects a higher idle thrust which gives better protection against flame-out.

ANTI ICE ON reduces the descent path angle (when the engines are at idle). The pilot can compensate for this by increasing the descent speed, or by extending up to half speedbrakes.



DESCENT INITIATION

DESCENT ----- INITIATE

The normal method of initiating the descent is to select DES mode at the FMGS calculated top of descent (T/D).

➤ **If ATC requires an early descent:**

Use DES mode which will guide the aircraft down at a lower vertical speed in order to converge on the required descent path. (The pilot may use a V/S of -1 000 ft/min).

➤ **If ATC delays the descent:**

Beyond T/D, a DECELERATE message comes up on the PFD and MCDU. This suggests to the crew that it starts reducing speed towards green dot speed (with ATC permission). When cleared to descend, select DES mode with managed speed active.

DESCENT MONITORING

PF MCDU ----- PROG/PERF DES

PF MCDU should be set to PROG or PERF DES page:

- PROG page in order to get VDEV or RQD DIST TO LAND/DIRECT DIST TO DEST information
- PERF DES in order to get predictions down to any inserted altitude in DES/OP DES modes and EXP mode.

PNF MCDU ----- F-PLN
DESCENT ----- MONITOR

- When flying in NAV mode, use DES mode.

The aircraft descends along the descent flight path: the PFD and PROG page display VDEV, and can be monitored. All constraints of the flight plan are taken into account for the guidance.

- When the aircraft is flying in HDG or TRK mode, and thus out of the lateral F-PLN, DES mode is not available. The NDs show a level-off symbol along the flight path. Its position is based on the current active modes of AP/FD and A/THR. The flight crew can use this symbol to monitor the descent.

MCDU predictions assume a return to the lateral F-PLN and descent flight path. Note that whenever the lateral mode is changed from NAV to HDG/TRK the vertical mode reverts to V/S at the value pertaining at the time of the mode change.



DESCENT ADJUSTMENT

To increase the rate of descent:

- Increase descent speed (by use of selected speed) if comfort and ATC permit. It is economically better (Time/Fuel) than the following procedures.
- Maintain high speed as long as possible. (SPD LIM may be suspended, subject to ATC clearance).
- If the aircraft is high and at high speed, it is more efficient to keep the high speed to ALT* and decelerate, rather than to mix descent and deceleration.
- If the aircraft goes below the desired profile, use SPEED and the V/S mode to adjust the rate of descent.

Note: EXPEDITE DESCENT

If a high rate of descent is required, push the EXPED pushbutton on the FCU. The target speed for the descent now becomes M 0.8 or 340 kt, whichever is lower. The FMA will display THR IDLE/EXP DES/NAV.

THR IDLE	EXP DES ALT	NAV	AP1 1 FD 2 A/THR
----------	----------------	-----	------------------------

To return to DES mode, push the FCU ALT knob.

To return to SPEED/V/S modes, pull the FCU V/S knob.

SPEED BRAKE lever ----- **AS RQRD**

If engine anti-ice is selected in descent, the flight idle is increased. So, to maintain the rate of descent that the airplane had before engine anti-ice selection it may be necessary to use up to half speedbrakes to maintain the required rate of descent, in OPEN DES vertical mode. If the rate of descent has to be increased, full speedbrakes may be used.

In DES mode: If the aircraft is on, or below, the flight path and the ATC requires a higher rate of descent, do not use speedbrakes because the rate of descent is dictated by the planned flight path.

Thus, the A/THR may increase thrust to compensate for the increase in drag. In this case, use OPEN DES with speedbrakes.

Note:

1. If speedbrakes are used above 315 kt/M .75, with the AP engaged, their rate of retraction is low (total time for retraction from full extension is approximately 25 s). The ECAM memo page displays SPD BRAKES in amber until retraction is complete.

2. In order to avoid overshooting the altitude, due to speedbrake retraction in ALT mode, retract the speedbrakes at least 2 000 ft before the selected altitude.*

RADAR TILT knob ----- **ADJUST**
BARO REF ----- **SET**

Set QNH on the EFIS control panel and on the standby altimeter when cleared for an altitude. Crosscheck BARO settings and altitude readings.

TERR ON ND ----- **AS RQRD**

- In mountainous areas, consider displaying terrain on ND.
- If use of radar is required, consider selecting the radar display on the PF side, and TERR ON



ND on the PNF side only.

ECAM STATUS ----- CHECK

- Check that there is no status reminder on the upper ECAM display.
- If there is a status reminder, check the aircraft STATUS.
- Check the ECAM status page before completing the approach checks. Take particular note of any degradation in landing capability, or any other aspect affecting the approach and landing.

AT 10 000 FT

LAND lights ----- ON

LAND lights may be switched ON, according to the airline policy/regulatory recommendations.

SEAT BELTS sw ----- AS RQRD

EFIS option ----- CSTR

Select CSTR on both sides.

LS pushbutton ----- AS RQRD

Select LS, if an ILS or LOC approach is intended.

The PFD displays the LOC and glide scales and deviation symbol, if there is a valid ILS signal.

RAD NAVAIDS ----- SELECTED/IDENTIFIED

Ensure that appropriate radio NAVAIDS are tuned and identified.

NAV ACCURACY ----- CHECK

No navigation accuracy check is required, as long as GPS PRIMARY function is available.

Otherwise, crosscheck NAV ACCURACY using the PROG page (BRG/DIST computed data), and the ND (VOR/DME raw data).



INITIAL APPROACH

ENG MODE selector ----- AS RQRD

Select IGN if the runway is covered with standing water, or if heavy rain or severe turbulence is expected during approach or go-around.

SEAT BELTS sw ----- ON/AUTO

APPROACH PHASE ----- CHECK/ACTIVATE

- If the aircraft overflies the DECEL pseudo waypoint in NAV mode, the APPR phase activates automatically

- If the aircraft is in HDG/TRK mode, approximately 15 nm from touchdown activate and confirm APPROACH phase on the MCDU.

POSITIONING ----- MONITOR

- In NAV mode, use VDEV information on the PFD and PROG page

- In HDG or TRK mode, use the energy circle on ND representing the required distance to land.

MANAGED SPEED ----- CHECK

If ATC requires a particular speed, then use selected speed. When the ATC speed constraint no longer applies, return to managed speed.

SPEED BRAKES lever ----- AS RQRD

If the pilot uses speed brakes to increase the rate of deceleration, or to increase the rate of descent, it is important to note that VLS with speed brakes fully extended, in the clean configuration, may be higher than green dot speed and possibly than VFE FLAP 1. The A/THR in speed mode, or the pitch demand in OPEN DES, will limit the speed to VLS. In this situation, the pilot should begin to retract speed brakes upon reaching VLS + 5kts and should select FLAP 1, as soon as speed is below VFE NEXT. The speed brakes may then be extended, if necessary. The landing gear may always be extended out of sequence to facilitate deceleration.

RADAR TILT ----- ADJUST

NAV ACCURACY ----- MONITOR



INTERMEDIATE/FINAL APPROACH

The objective is to be stabilized on the final descent path at VAPP in the landing configuration, at 1000ft above airfield elevation (in instrument conditions, or at 500ft above airfield elevation in visual conditions, after continuous deceleration on the glide slope).

To be stabilized, all of the following conditions must be achieved prior to, or upon reaching this stabilization height:

- The aircraft is on the correct lateral and vertical flight path
- The aircraft is in the desired landing configuration
- The thrust is stabilized, usually above idle, to maintain the target approach speed along the desired glide path
- No excessive flight parameter deviation.

If the aircraft is not stabilized on the approach path in landing configuration, the flight crew must initiate a go-around, unless they think that only small corrections are necessary to rectify minor deviations from stabilized conditions due, amongst others, to external perturbations.

APPR pb on FCU ----- PRESS

- Press the APPR pb, only when ATC clears the aircraft for the approach. This arms the LOC and G/S modes
- LOC and/or G/S capture modes will engage no sooner than 3 s after being armed.

BOTH APs ----- ENGAGE

When APPR mode is selected, AP1 pb and AP2 pb should be engaged.

AT GREEN DOT SPEED

FLAPS 1 ----- SELECT

FLAPS 1 should be selected more than 3 nm before the FAF (Final Approach Fix).

Note: The ECAM automatically displays the STATUS page, if it is applicable, and if the flight crew has not already selected a system page manually.

- Check deceleration toward "S" speed
- The aircraft must reach, or be established on, the glideslope with FLAPS 1 and S speed at, or above, 2 000 ft AGL.
- If the aircraft speed is significantly higher than S on the glideslope, or if the aircraft does not decelerate on the glideslope, extend the landing gear to slow it down. It is also possible to use speed brakes. However, the flight crew should be aware that the use of speed brakes causes an increase in VLS.

TCAS Mode selector ----- TA or TA/RA

The flight crew should use the TA/RA mode as the default mode of the TCAS.

The flight crew may use the TA ONLY mode in specific airports, and for specific procedures that may provide resolution advisories that are neither wanted nor appropriate (e.g. closely-spaced parallel runways).

FMA ----- CHECK

LOC CAPTURE ----- MONITOR

The flight crew must always monitor the capture of LOC beam. During the capture phase, the associated deviation indications on the PFD and ND must indicate movement towards the center of the scale.



G/S CAPTURE ----- MONITOR

▪ **If above the glideslope:**

FCU ALTITUDE ----- SET ABOVE A/C ALTITUDE

V/S mode ----- SELECT

Note:

1. When reaching VFE, the AP maintains VFE and reduces the V/S without MODE REVERSION.

2. If the aircraft intercepts the ILS above the radio altimeter validity range (no radio altitude indication available on the PFD), CAT 1 is displayed on the FMA. Check that the FMA displays the correct capability for the intended approach, when the aircraft is below 5 000 ft.

GO-AROUND ALT ----- SET

Set the go around altitude on the FCU.

AT 2 000 FT AGL (MINIMUM)

FLAPS 2 ----- SELECT

- Check deceleration towards F speed

- If the aircraft intercepts the ILS glideslope below 2 000 ft AGL, select FLAPS 2 at one dot below the glideslope

- If the aircraft speed is significantly higher than S on the glide slope, extend the landing gear in order to slow down the aircraft. The use of speed brakes is not recommended

WHEN FLAPS ARE AT 2

LDG GEAR ----- SELECT DOWN

AUTO BRK ----- CONFIRM

If the runway conditions have changed from the approach briefing, consider another braking mode.

GROUND SPOILERS ----- ARM

EXTERIOR LIGHTS ----- SET

Set:

- The NOSE selector to TAXI

- The RWY TURN OFF sw to ON

WHEN LANDING GEAR IS DOWN

FLAPS 3 ----- SELECT

Select FLAPS 3 below VFE next.

WHEEL SD page ----- CHECK

- WHEEL SD page appears below 800 ft, or at landing gear extension.

- Check for three green indications on the landing gear indicator panel. At least one green triangle on each landing gear strut on the WHEEL SD page is sufficient to indicate that the landing gear is down and locked.



FLAPS FULL ----- SELECT

Select FLAPS FULL below VFE next.

Retract the speed brakes before selecting FLAPS FULL to avoid an unexpected pitch down, when the speed brakes retract automatically.

Check deceleration towards VAPP.

A/THR ----- CHECK IN SPEED MODE OR OFF
WING ANTI-ICE ----- OFF

Only switch the WING ANTI ICE to ON, in severe icing conditions.

SLIDING TABLE ----- STOW
LDG MEMO ----- CHECK NO BLUE LINE
CABIN REPORT ----- OBTAIN
CABIN CREW ----- ADVISE
LANDING CHECK LIST ----- COMPLETE
FLIGHT PARAMETERS ----- CHECK

AT MINIMUM + 100 FT :

ONE HUNDRED ABOVE ----- MONITOR OR ANNOUNCE

AT MINIMUM :

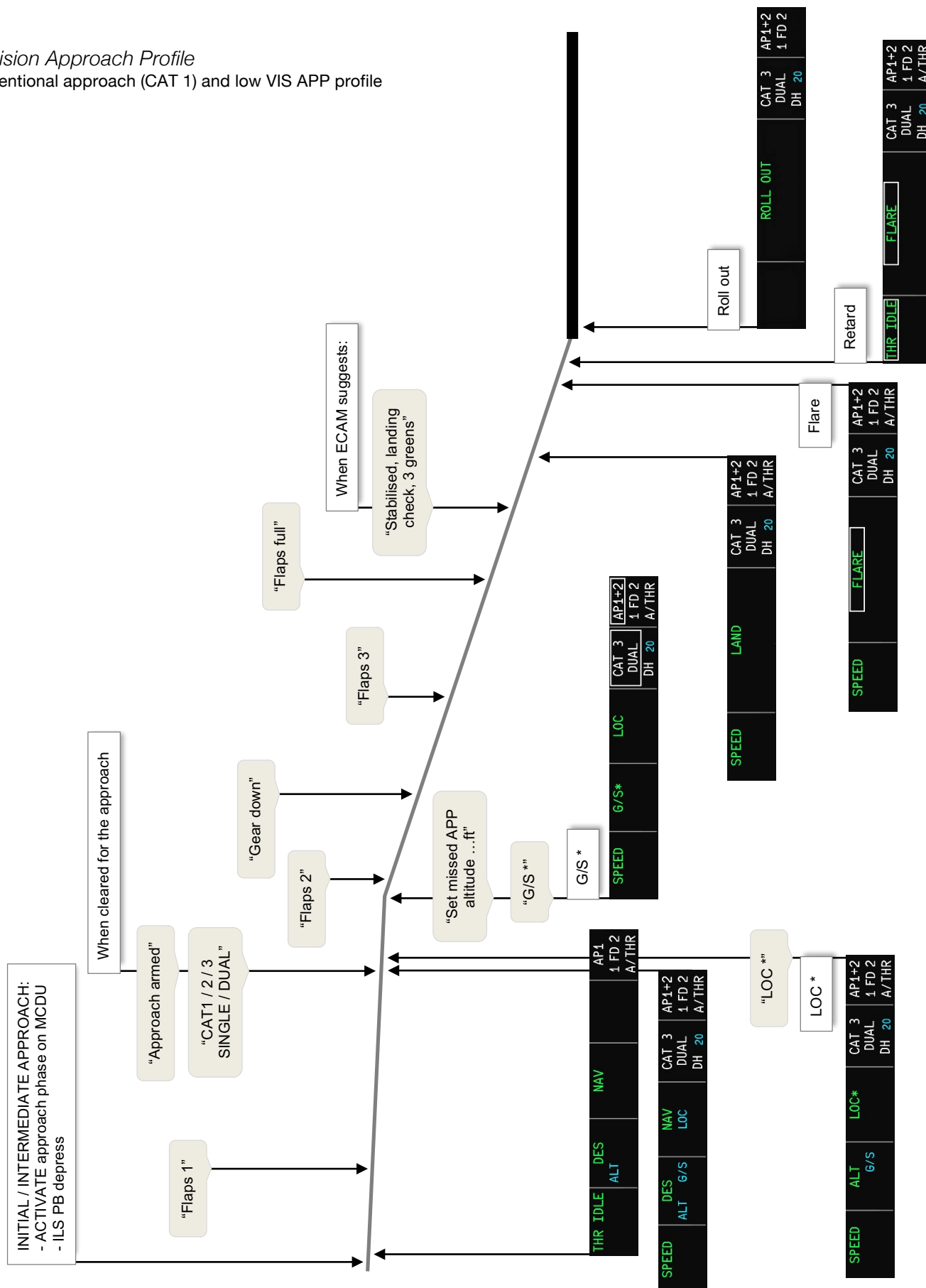
MINIMUM ----- MONITOR OR ANNOUNCE
CONTINUE OR GO AROUND ----- ANNOUNCE

Maintain a stabilized flight path down to the flare. At 50 ft, one dot below the glideslope is 7 ft below the glideslope.



Precision Approach Profile

Conventional approach (CAT 1) and low VIS APP profile





INITIAL APPROACH

ENG START selector ----- AS RQRD

Select IGN if the runway is covered with standing water, or heavy rain, or if severe turbulence is expected in the approach or go-around area.

SEATBELTS ----- ON/AUTO

APPROACH PHASE ----- ACTIVATE

- In NAV mode, the APPR phase automatically activates at the DECEL pseudo waypoint.

- In HDG or TRK mode, manually activate the APPR phase on the PERF APPR page, when the distance to land is approximately 15 nm.

POSITIONING ----- MONITOR

- In NAV mode, use VDEV information on the PFD and PROG page.

- In HDG or TRK mode, use the energy circle displayed on ND representing the required distance to land.

MANAGED SPEED ----- CHECK

SPEEDBRAKES lever ----- AS RQRD

RADAR TILT ----- ADJUST

NAVIGATION ACCURACY ----- MONITOR

When GPS PRIMARY is available, no accuracy check is required.

When GPS PRIMARY is lost, check the PROG page to ensure that the required navigation accuracy is appropriate to the phase of flight. Perform a navigation accuracy check.

APPROACH CHECKLIST ----- PERFORM

INTERMEDIATE / FINAL APPROACH

RNAV APPROACH

GPS 1+2 on GPS MONITOR page ----- CHECK BOTH IN NAV

GPS PRIMARY on PROG page ----- CHECK AVAILABLE

➤ If GPS PRIMARY is not available

RNP for approach ----- CHECK/ENTER

HIGH accuracy ----- CHECK

APPR MODE ACTIVATION

➤ For approach in managed vertical guidance:

APPR pb on FCU ----- PRESS

Once cleared for the approach, press the pushbutton when flying towards the FAF. Check that APPR NAV is engaged, FINAL is armed, and the VDEV scale is on the PFD.



AT GREEN DOT SPEED

FLAPS 1 ----- SELECT

- Check deceleration toward S speed.

- If the aircraft speed is significantly higher than S speed on the glideslope, or if the aircraft does not decelerate on the flight path, extend the landing gear to slow it down. It is also possible to use speedbrakes. However, the flight crew must be aware that the use of speedbrakes causes an increase in VLS.

TCAS Mode selector ----- TA or TA/RA

The flight crew should use the TA/RA mode as the default mode of the TCAS.

The flight crew may use the TA ONLY mode in specific airports, and for specific procedures that may provide resolution advisories that are neither wanted nor appropriate (e.g. closely-spaced parallel runways).

ND DISPLAY ----- SELECT RANGE/MODE

AT S SPEED

FLAPS 2 ----- SELECT

- Check deceleration toward F speed.

- If the aircraft speed is significantly higher than F speed on the flight path, or if the aircraft does not decelerate on the flight path, extend the landing gear in order to slow down the aircraft. The use of speedbrakes is not recommended.

WHEN FLAPS ARE AT 2

LDG GEAR ----- SELECT DOWN

AUTO BRK ----- CONFIRM

If the runway conditions have changed from the approach briefing, consider another braking mode.

GROUND SPOILERS ----- ARM

EXTERIOR LIGHTS sw ----- SET

Set NOSE selector to TAXI and RWY TURN OFF sw to ON.

WHEN LANDING GEAR DOWN

FLAPS 3 ----- SELECT

Select FLAPS 3 below VFE next.

WHEEL SD page ----- CHECK

- The WHEEL SD page appears below 800 ft, or at landing gear extension.

- Check for three green indications on the landing gear indicator panel. At least one green triangle on each landing gear strut on the WHEEL SD page is sufficient to indicate that the landing gear is down and locked.

FLAPS FULL ----- SELECT

- Select FLAPS FULL below VFE next.



- Retract the speedbrakes before selecting FLAPS FULL to prevent a pitch down when the speedbrakes automatically retract.
- Check deceleration toward VAPP.
- Check correct TO waypoint on the ND.

APPROACH STRATEGIES

MANAGED VERTICAL GUIDANCE

➤ **After the FAF:**

FMA ----- CHECK

Check FINAL APP green on the FMA.

GO AROUND ALTITUDE ----- SET

Set, when below the go-around altitude.

POSITION/FLIGHT PATH ----- MONITOR

- For approach in overlay to a conventional radio NAVAID procedure:
Use radio NAVAID raw data and altitude to monitor the lateral and vertical navigation. If the navigation is not satisfactory, revert to selected guidance. In particular, monitor the vertical guidance, using altitude indication versus radio NAVAID position, and be prepared to revert to NAV-FPA, if the vertical guidance is not satisfactory.

- For RNAV approach:
Monitor VDEV and FPV (on the PFD) and XTK error (on the ND).
Use altitude indication versus distance to the runway to monitor the vertical navigation. If the vertical guidance is not satisfactory, revert to NAV/FPA or consider the go-around. If the lateral guidance is not satisfactory, perform a go-around.

SELECTED VERTICAL OR SELECTED LATERAL AND VERTICAL GUIDANCE

➤ **At FAF:**

FPA for final approach ----- SET

➤ **After the FAF:**

GO AROUND ALTITUDE ----- SET

Set, when below the go-around altitude.

POSITION/FLIGHT PATH ----- MONITOR/ADJUST

- For approach in overlay to a conventional radio NAVAID procedure:
Use radio NAVAID raw data to monitor the lateral navigation. Using altitude indication versus radio NAVAID position, adjust the FPA, as necessary, to follow the published descent profile, taking into account the minimum altitudes. Do not use the FMGC VDEV on the PFD. If the lateral navigation is not satisfactory, revert to TRK/FPA.

- For RNAV approach:
Monitor XTK error on ND.
Using altitude indication versus distance to the runway, adjust the FPA as necessary to follow the published descent profile, taking into account the minimum altitudes. If the lateral guidance is not satisfactory, perform a go-around.



FINAL APPROACH

A/THR pb ----- CHECK IN SPEED MODE OR OFF
WING ANTI ICE pb-sw ----- OFF

Switch WING ANTI ICE pb-sw ON in severe icing conditions only.

SLIDING TABLE ----- STOW
LDG MEMO ----- CHECK NO BLUE LINE
CABIN REPORT ----- OBTAIN
CABIN CREW ----- ADVISE
LANDING CHECKLIST ----- COMPLETE
FLIGHT PARAMETERS ----- CHECK

AT ENTERED MINIMUM+ 100 FT

ONE HUNDRED ABOVE ----- MONITOR OR ANNOUNCE

AT ENTERED MINIMUM

MINIMUM ----- MONITOR OR ANNOUNCE

Note: When the aircraft reaches minimum minus 50 ft, the autopilot remains engaged and will automatically disengage at MAP.

➡ If ground references are visible:

CONTINUE ----- ANNOUNCE

AP pb ----- OFF

Continue, as with a visual approach Refer to PRO-NOR-SOP-20-A Visual Approach - Introduction

➡ If ground references are not visible:

GO AROUND ----- ANNOUNCE

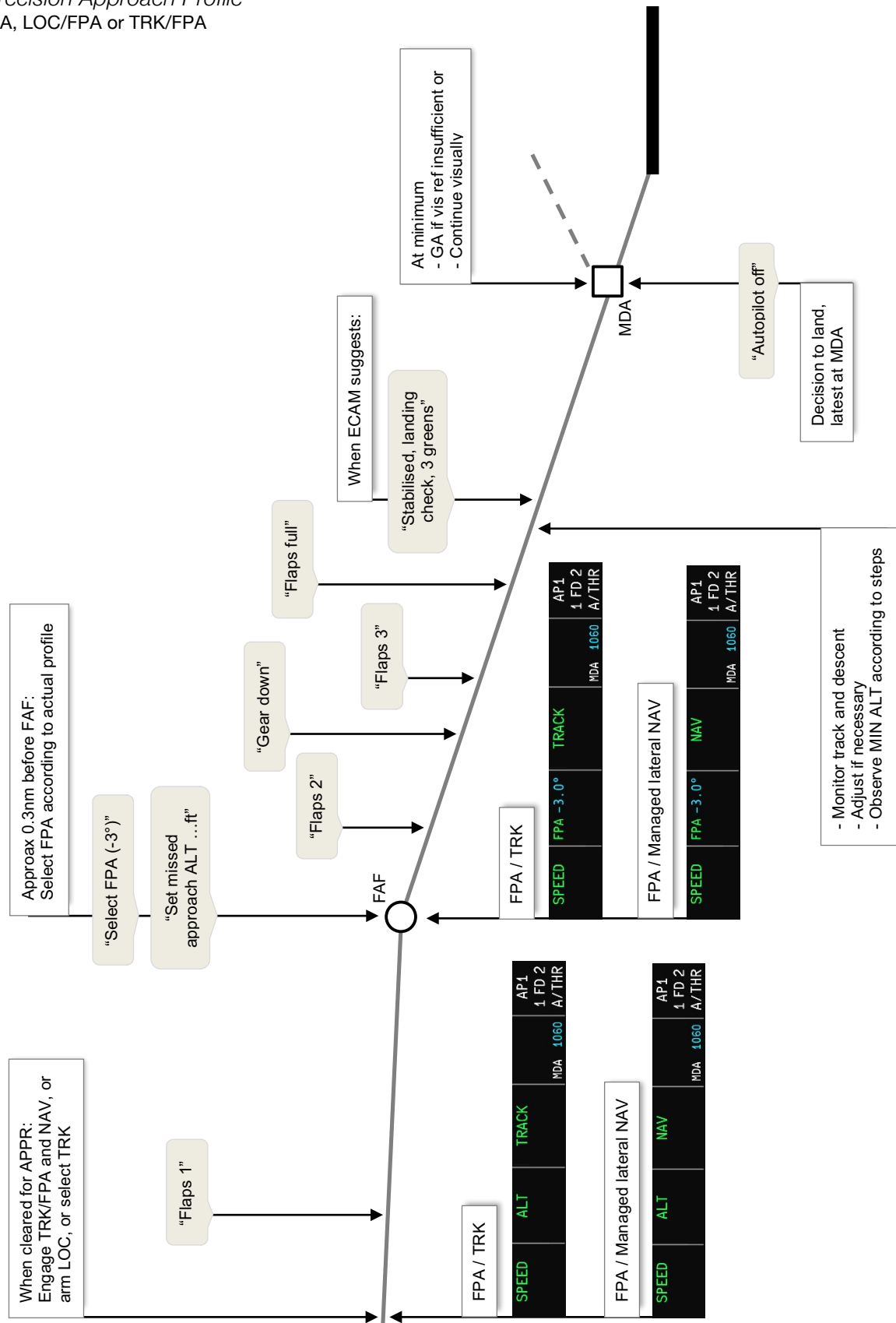
Initiate a go-around.

Note:

In selected guidance, if ground references are not visible when the aircraft reaches minimum, the flight crew should make an immediate go-around. However, if the distance to the runway is not properly assessed, a step descent approach may be considered and a level-off at minimum may be performed while searching for visual references. If the flight crew has no visual reference at MAP, at the latest, they must begin a go-around.



Non-Precision Approach Profile
NAV/FPA, LOC/FPA or TRK/FPA





CIRCLING APPROACH

The circling approach is the visual phase of an instrument approach to bring an aircraft into position for landing on a runway which is not suitably located for a straight-in approach.

CAUTION The flight crew must conduct the flight within the circling area, while maintaining required visual references at all times.

APPROACH PREPARATION

For a circling approach, the approach preparation should include the following additional items in the FMS programming.

F-PLN

Introduce the instrument approach procedure, including the missed approach procedure for instrument approach.

SEC F-PLN

The landing runway must be inserted into the SEC F-PLN.

Update the SEC F-PLN as follows:

- Copy the active F-PLN
- Revise the landing runway.

INSTRUMENT APPROACH

The flight crew flies a stabilized approach at F speed, configuration 3 and landing gear down.

CIRCLING APPROACH

➤ At the Circling MDA(H) at the latest:

Perform a level off

➤ At MAP, if the flight crew finds no visual reference:

Initiate a Go-Around

➤ When required conditions for circling are satisfied:

Select TRK-FPA,

Proceed to downwind leg,

At any time in the downwind leg, activate the SEC F-PLN,

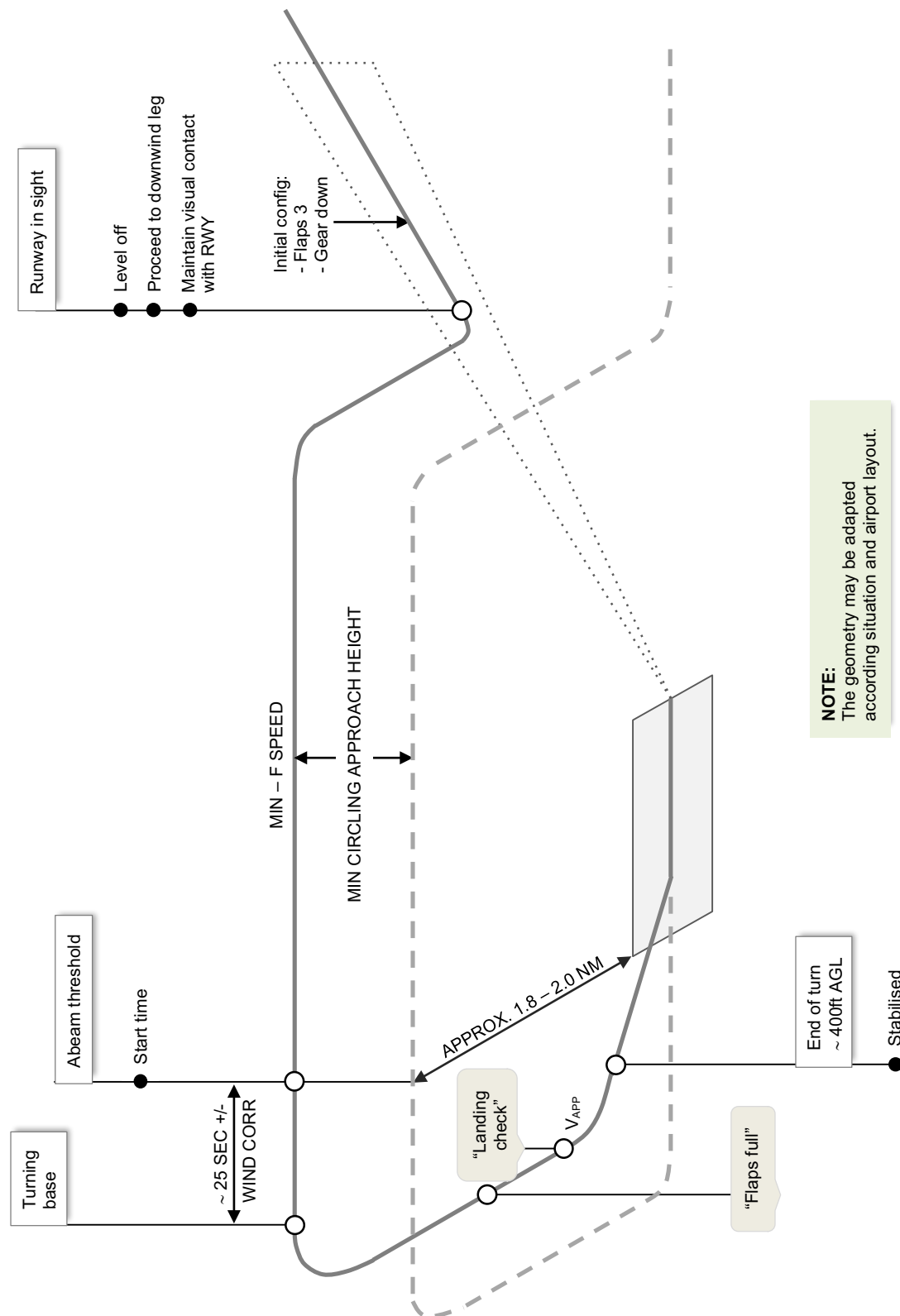
Disconnect the AP and remove the FDs at the latest before starting the descent toward the runway,

Set the landing configuration when appropriate, but ensure early stabilization in final.

If, at any time during the circling procedure, the required visual references are lost, initiate a go-around following the missed approach of the initial instrument approach (unless otherwise specified)



Circling Approach Profile
TRK/FPA





VISUAL APPROACH

INTRODUCTION

Perform the approach on a nominal 3 ° glideslope using visual references. Approach to be stabilized by 500 ft AGL on the correct approach path, in the landing configuration, at VAPP.

Method:

- The autopilot is not used
- Both FDs are off
- FPV use is recommended
- A/THR use is recommended with managed speed.

Bear in mind the possible risk of optical illusions due to hindered night vision.

INITIAL / INTERMEDIATE APPROACH

The flight plan selected on the MCDU should include the selection of the landing runway. The downwind leg may also be part of the flight plan. This may be a useful indication of the aircraft position in the circuit on the ND.

However, visual references must be used.

Therefore, at the beginning of the downwind leg:

- Manually ACTIVATE APPR.
- Select FDs to OFF.
- Select TRK-FPA to have FPV displayed.
- Check A/THR active.

Extend the downwind leg to 45 s (\pm wind correction).

Turn into base leg with a maximum of 30 ° of bank. Descent with approximate FPA, in FLAPS 2, at F speed.

FINAL APPROACH

The speed trend arrow and FPV help the flight crew make timely and correct thrust settings (if in manual thrust), and approach path corrections.

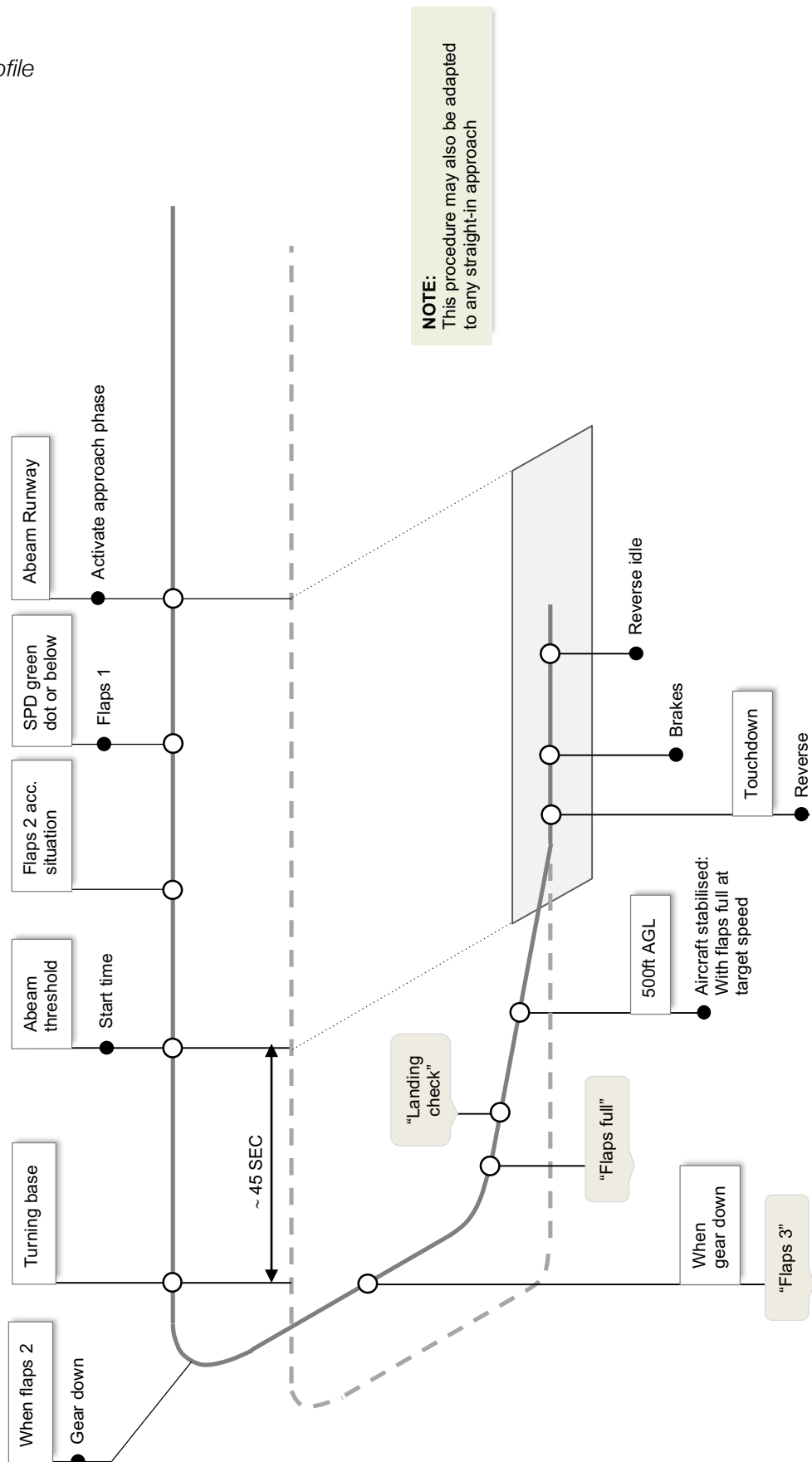
Avoid descending through the correct approach path with idle thrust. (Late recognition of this situation without a prompt thrust increase may lead to considerable speed decay and altitude loss).

Ensure that the aircraft is stabilized on the final descent path at VAPP (or ground speed mini) in the landing configuration with the thrust stabilized (usually above idle) at 500 ft above airfield elevation.

If the aircraft is not stabilized, the flight crew must initiate a go-around, unless they think that only small corrections are necessary to rectify minor deviations from stabilized conditions due, amongst others, to external perturbations.



Visual Approach Profile





LANDING

FLARE

In stabilized approach conditions, the flare height is approximately 30 ft:

FLARE ----- PERFORM
ATTITUDE ----- MONITOR
THRUST levers ----- IDLE

If autothrust is engaged, it automatically disconnects when the pilot sets both thrust levers to the IDLE detent.

In manual landing conditions, the "RETARD" callout is triggered at 20 ft Radio Altitude (RA), in order to remind the pilot to retard the thrust levers.

Note: If one or both thrust levers remain above the IDLE detent, ground spoilers extension is inhibited.

GROUND CLEARANCE

A tail strike occurs, if the pitch attitude exceeds 15.5 ° (13.5 ° with the landing gear compressed).

A wingtip or engine scrape occurs, if the roll angle exceeds 18 ° (16 ° with the landing gear compressed).

Be aware of the pitch-up tendency, with ground spoiler extension.

AT TOUCHDOWN

DEROTATION ----- INITIATE

- Lower the nosewheel without undue delay.

BOTH THRUST LEVERS ----- REV MAX or REV IDLE

- On dry runway only and if landing performance permits, the flight crew can select and maintain REV IDLE until taxi speed is reached. For any other case, immediately select REV MAX on all reverser levers after main landing gear touches down.

A slight pitch up that can be easily controlled by the pilot, may occur when the thrust reversers are deployed before the nose landing gear touches down.

- After the flight crew selects reverse thrust, they should perform a full stop landing.

GROUND SPOILERS ----- CHECK

Check that the WHEEL SD page displays the ground spoilers extended after touchdown.

If no ground spoilers are extended:

- Verify and confirm that both thrust levers are set to IDLE or REV detent.*
- Set both thrust reverser levers to REV MAX, and fully press the brake pedals.*

Note: If ground spoilers are not armed, ground spoilers extend at reverser thrust selection.

REVERSERS ----- CHECK

Check that the ECAM E/WD displays that the reverse deployment is as expected (REV green).

DIRECTIONAL CONTROL ----- MONITOR/ENSURE



- Monitor directional control, if the rollout is automatic.
- Ensure directional control, if rollout is manual. Use rudder pedals for directional control.
- Do not use the nosewheel steering control handle before reaching taxi speed.
- If directional control problems are encountered, the flight crew should reduce thrust to reverse idle until directional control is satisfactory.

BRAKES ----- AS RQRD

- Monitor the autobrake, if it is ON. When required, brake with the pedals
- Although the green hydraulic system supplies the braking system, if pedals are pressed rapidly, a brake pressure indication appears briefly on the BRAKE PRESS indicator.
- Braking may begin before the nosewheel has touched down, if required for performance reasons. However, when comfort is the priority, the flight crew should delay braking until the nosewheel has touched down.

Note: If no ground spoilers are extended, the autobrake is not activated.

DECELERATION ----- CHECK

*The deceleration is felt by the flight crew, and confirmed by the speed trend on the PFD.
The deceleration may also be confirmed by the DECEL light (if autobrake is ON).*

AT 70 KTS

BOTH THRUST LEVERS ----- REV IDLE

It is better to reduce thrust when passing 70kts. However, high levels of reverse thrust may be used in order to control aircraft speed in case of an emergency.

CAUTION *Avoid the use of high levels of reverse thrust at low airspeed, unless required due to an emergency. The distortion of the airflow, caused by gases reentering the compressor, can cause engine stalls that may result in excessive EGT.*

AT TAXI SPEED

BOTH THRUST LEVERS ----- FWD IDLE

- When reaching taxi speed, and before leaving the runway, deselect the reversers.
- On snow-covered grounds, the reversers should be stowed when the speed reaches 25kts.
- When deselecting the reversers, be careful not to apply forward thrust by moving the thrust levers beyond the FWD IDLE position.

CAUTION *Except in an emergency, do not use the reverse thrust to control the aircraft speed while on taxiways.*

On taxiways, the use of reversers, even when restricted to idle thrust, would have the following effects:

- The engines may ingest fine sand and debris that may be detrimental to the engines and airframe systems.
- On snow-covered areas, snow will recirculate into the air inlet, and may cause an engine flameout or rollback.

BEFORE 20 KTS

AUTO BRK ----- DISENGAGE



GO AROUND WITH FD

Apply the following three actions simultaneously:

THRUST levers ----- TOGA

If TOGA thrust is not required, set the thrust levers to TOGA detent then retard the thrust levers as required. This enables to engage the GO-AROUND phase, with associated AP/FD modes.

Note: If the thrust levers are not set briefly to TOGA detent, the FMS does not engage the GO-AROUND phase, and flying over, or close to the airport (less than 7 nm) will sequence the Destination waypoint in the F-PLN.

ROTATION ----- PERFORM

Initiate rotation towards 15 ° of pitch with all engines operative (approximately 12.5 ° if one engine is out) to get a positive rate of climb, then follow the SRS Flight Director pitch bars orders.

FLAPS lever ----- SELECT AS RQRD

Retract one step of flaps.

FMA ----- CHECK

*Check the FMA on the PFD. The following modes are displayed:
MAN TOGA / SRS / GA TRK /A/THR (in blue)*

MAN TOGA	SRS CLB	GA TRK	AP1 1 FD 2 A/THR
-------------	------------	--------	------------------------

LDG GEAR UP ----- SELECT

NAV or HDG mode ----- AS RQRD

Reselect NAV or HDG, as required (minimum height 100 ft).

AP ----- AS RQRD

Note: Go-around may be flown with both autopilots engaged. Whenever any other mode engages, AP 2 disengages.

AT GO-AROUND THRUST REDUCTION ALTITUDE

THRUST levers ----- CL

LVR CLB flashing on FMA.

AT GO-AROUND ACCELERATION ALTITUDE

Monitor that the target speed increases to green dot.

➡ **If the target speed does not increase to green dot:**

ALT knob ----- CHECK and PULL

➡ **At F speed:**

FLAPS 1 ----- SELECT



➡ **At S speed:**

FLAPS ZERO ----- SELECT
GRND SPLRS ----- DISARM
EXTERIOR LIGHTS ----- SET

Set to OFF the NOSE sw and the RWY TURN OFF sw.

The flight crew can maintain the LAND sw set to ON, according to airline policy or regulatory recommendations.

Note: Consider the next step:

- Engage NAV mode, to follow the published missed approach procedure, or
- Prepare for a second approach by selecting the ACTIVATE APP PHASE, and CONFIRM on the PERF page.



AFTER LANDING

LAND lights ----- RETRACT

Retract landing lights, unless they are needed.

STROBE selector ----- AUTO

When leaving the runway, set the STROBE lights to AUTO.

OTHER EXT LIGHTS ----- AS RQRD

GROUND SPOILERS ----- DISARM

RADAR ----- OFF/STBY

PREDICTIVE WINDSHEAR SYSTEM ----- OFF

Switching the radar and predictive windshear system OFF after landing avoids risk of radiating persons at the gate area.

ENG MODE selector ----- NORM

FLAPS ----- RETRACT

Set the FLAPS lever to position 0.

If the approach was made in icing conditions, or if the runway was contaminated with slush or snow, do not retract the flaps and slats until after engine shutdown and after the ground crew has confirmed that flaps and slats are clear of obstructing ice.

On ground, hot weather conditions may cause overheating to be detected around the bleed ducts in the wings, resulting in "AIR L (R) WING LEAK" warnings. Such warnings may be avoided during transit by keeping the slats in Configuration 1 when the OAT is above 30 °C.

TCAS ----- SET on standby

ATC ----- AS RQRD

APU ----- START

APU START may be delayed until just prior to engine shutdown.

ANTI ICE ----- AS RQRD

If engine anti-ice is used, take care to control taxi speed, especially on wet or slippery surfaces. (N1 ground idle is increased).

BRAKE TEMPERATURE ----- CHECK

- Check brake temperature on the WHEEL SD page for discrepancies and high temperature.

- If brake fans are installed:

Brake fans selection should be delayed for a minimum of about 5 min, or done just before stopping at the gate (whichever occurs first), to allow thermal equalization and stabilization and thus avoid oxidation of brake surface hot spots. Selecting the brake fans before reaching the gate prevents the brake fans from blowing carbon brake dust on the ground personnel. However, when turnaround times are short, or brake temperatures are likely to exceed 500°C, use the brake fans, disregarding possible oxidation phenomenon.

AFTER LANDING CHECKLIST ----- COMPLETE

Ensure that the after-landing checks are completed, once the aircraft has cleared the runway.



PARKING

PARKING BRAKE ACCU PRESS ----- CHECK

The ACCU PRESS indication must be in the green band. In case of low accumulator pressure, chocks are required before engine 1 shutdown.

PARK BRK handle ----- ON

When one brake temperature is above 500 °C (or 350 °C with brake fans ON), avoid applying the parking brake, unless operationally necessary.

Check the brake pressure on Triple Indicator for the left and right brakes.

ANTI-ICE ----- OFF

APU BLEED pb-sw ----- ON

Select APU bleed ON, just before engine shutdown, to prevent engine exhaust fumes from entering the air conditioning.

ENG 1 MASTER sw and ENG 2 MASTER sw ----- OFF

After landing, operate the engine at idle for 3 min before shutdown in order to thermally stabilize the hot section of the engine. This 3 min period includes operational time at idle (e.g. taxiing).

*If APU is not available, set EXT PWR pb to ON, then set ENG MASTERS to OFF.
Check that engine parameters decrease.*

GROUND CONTACT ----- ESTABLISH

*Establish ground communication.
Check chocks in place.*

SLIDE DISARMED ----- CHECK

Check slides disarmed on the DOOR/OXY SD page.

BEACON sw LT ----- OFF

Turn off the BEACON lights, when all engines are spooled down.

OTHER EXTERIOR LIGHTS ----- AS RQRD

SEAT BELTS ----- OFF

ELAPSED TIME ----- STOP

FUEL PUMPS ----- OFF

ATC ----- SET on standby

IRS PERFORMANCE ----- CHECK

➤ **Residual ground speed check:**

CAPT and F/O NDs display the IRS 1 and 2 residual ground speeds respectively. The IRS 3 residual ground speed can be read on the CAPT ND by switching the ATT HDG selector to CAPT ON 3.

- If ground speed ≥ 15 kt: Report (The IR part of the ADIRU must be considered as failed, if the excessive deviation occurs after two consecutive flights).

- If ground speed ≥ 21 kt: Report (The IR part of the ADIRU must be considered as failed).



FUEL QUANTITY ----- CHECK

Check that the sum of the fuel on board and the fuel used is consistent with the fuel on board at departure. If an unusual discrepancy is found, maintenance action is due.

STS pb (ECAM Control panel) ----- PRESS

Check the STATUS page.

BRAKE FAN ----- OFF

Switch off if not required.

PARKING BRAKE ----- AS RQRD

The parking brake should be released after chocks are in place, if one brake temperature is above 300 °C (or above 150 °C with brake fans ON).

Releasing the parking brake prevents the critical structures from being exposed to high temperature levels for an extended time. However, if operational conditions dictate (e.g. slippery tarmac), the parking brake may remain applied.

DUs ----- DIM

Dim EFIS, ECAM and MCDU display units.

PARKING CHECKLIST ----- COMPLETE



SECURING THE AIRCRAFT

PRK BRK handle ----- CHECK ON

To reduce hydraulic leak rate in the brake accumulator, keep the parking brake on.

OXYGEN CREW SUPPLY pb ----- OFF

ADIRS (1+2+3) ----- OFF

ADIRS should not be switched off during transits at latitudes above 73 °N, to avoid their requiring excessive alignment time.

After having switched off the ADIRS, wait at least 10 s before switching off the electrical supply to ensure that the ADIRS memorize the latest data.

EXTERIOR LIGHTS ----- OFF

APU BLEED pb-sw ----- OFF

APU MASTER SW pb-sw ----- OFF

Switch off the APU after the passengers have disembarked.

EMER EXIT LT selector ----- OFF

SIGNS selector ----- OFF

EXT PWR pb ----- AS RQRD

BAT 1 pb-sw and BAT 2 pb-sw ----- OFF

Wait until the APU flap is fully closed (about 2 min after the APU AVAIL light goes out), before switching off the batteries. Switching the batteries off before the APU flap is closed may cause smoke in the cabin during the next flight.

If the batteries are off while the APU is running, APU fire extinguishing is not available.

SECURING THE AIRCRAFT CHECKLIST ----- COMPLETE